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Achieving Food Security in a Post Conflict Context

Recommendations for a Farmer Field School Approach in the Greenbelt of South Sudan

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Cover photos	Woman farmer of Alotto FFS showing exemples of the benefit of the FFS (Ilse Hoffmann)

Foreword

For 50 years, the Centre for Rural Development (SLE – Seminar für Ländliche Entwicklung), Humboldt Universität zu Berlin, trains young professionals for the field of German and international development cooperation.

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In 2012, SLE teams have completed studies in Congo and South Sudan, in Liberia and Moldova.

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We dedicate this study to the farmers in the Greenbelt of South Sudan hoping that our research might contribute to an improvement in their livelihood.

Summary

Context

The Gesellschaft für Internationale Zusammenarbeit (GIZ) started running Development-Oriented Emergency and Transitional Aid (DETA) projects in South Sudan in 2008. Today GIZ DETA is active across the three states of Greater Equatoria where it supports host communities, returnees, and internally displaced people (IDPs) to reconstruct their lives. After nearly five decades of warfare, the new Government of South Sudan (GOSS) faces immense challenges, which include the repatriation of citizens from exile, the diversification of its oil-dependent economy, as well as securing peace within the country's borders. One year after independence, South Sudan is ranked fourth on the list of the world's failed states. Further state building measures are necessary. Accordingly GIZ DETA has 4 project components: institution building, agricultural development, infrastructure rehabilitation, and peace building. In terms of agricultural support, the project has so far offered food-based emergency relief and recovery aid. With repatriation activities nearing completion in the project area, GIZ DETA is now shifting the focus to linking relief with rehabilitation and longer-term development (LRRD). As over half of all South Sudanese live in absolute poverty, and 80% of the population earns a living from small-scale farming, agriculture is a strategic sector for the GOSS. The agricultural sector needs to receive adequate investments to become competitive with neighbouring countries, especially with Uganda (World Bank 2012). If agriculture is not revived, it will be impossible to lift the majority of the South Sudanese out of poverty and food insecurity (GOSS/World Bank 2007).

GIZ DETA has been running a pilot phase of Farmer Field Schools (FFS) in the Central Equatoria State since April 2012. The goal of these FFS is to increase farmers' productivity and market-oriented production capacities. Promoted agronomic techniques are based on Low External Input and Sustainable Agriculture (LEISA). LEISA was strategically chosen to increase the stability and resilience of local food supplies. Resulting increases in agricultural output are expected to increase local food availability. The market orientation of farmers is to generate income, which will contribute to household food security.

Study Approach

The study assesses GIZ DETA's pilot phase of Farmer Field Schools (FFS) for potential improvements. It also examines the possibilities of scaling up GIZ DETA's FFS approach to the Eastern and Western Equatoria States. For this purpose, data was collected at three locations, in Morobo County (Central Equatoria), in Magwi County (Eastern Equatoria) as well as in Yambio and Nzara County (Western Equatoria). Respective information was collected in three months of field research, using a quali-

tative research approach. Data collection methods included focus group discussions, semi-structured expert interviews, as well as feedback loops through participatory expert workshops. The most important findings are highlighted below.

Key Messages

Concerning the current situation in the Greenbelt

1. **Incidence of hunger and malnutrition is less severe in the three states of Greater Equatoria than in other states of South Sudan** (WFP 2012). During the hunger season, which extends from May until July, farming households in Eastern, Central, and Western Equatoria have at least one meal per day.
2. **The Greenbelt of South Sudan has a huge but largely unrealised agricultural potential.** The Greenbelt has traditionally been the surplus-producing agricultural region and has potential to become the 'bread-basket' of South Sudan. Two rainy seasons per year and virgin clay soils render this area highly productive for agriculture (GOSS 2010). Theoretically the Greenbelt is capable of feeding the entire population of South Sudan (USAID 2009, FAO 2012). Yet, cultivation mainly consists of traditional rain-fed subsistence agriculture. Cultivation is still characterised by low productivity and rudimentary cropping techniques. Average cereal yields are below 800kg/ha (GOSS 2011).
3. **Agricultural productivity of farmers in the Greenbelt is limited by low intensification. Access to land is not yet a limiting factor.** Small-scale farming households in the Greenbelt cultivate a maximum of 0.4 to 2.4 ha. Cultivation by hand hoe, an inaccessibility of tools, a low level of mechanisation, limited agronomic knowledge, and high labour costs currently limit farmers to cultivate an average area of no more than 0.8 ha. This is in spite of possibilities to access further land through communal land tenure agreements. Human population densities are still low in the Greenbelt, ranging from around 10 to 79 people per km^2 (UN-OCHA 2009, FAO 2012).
4. **There are no financial services or related institutions providing credits (financial capital) to small-scale farmers.** Farmers' collateral is small. Households have no surplus money to invest in farming. Income from farming is used to cover basic needs such as school fees, health expenses, etc. The budding financial sector in South Sudan, which provides agricultural loans, can at present only be accessed by registered producer associations and cooperatives.
5. **Poor road infrastructure and high transportation costs act as disincentives for farmers to take up commercial farming.** The poor quality of feeder roads in high potential areas is cutting off farmers from traders who supply peri-urban markets along the main road network. If combined with agricultural extension

and input provision, investments made to improve rural connectivity could transform the competitiveness of South Sudanese farmers (World Bank 2012).

Concerning GIZ DETA's existing FFS in Morobo County

1. **GIZ DETA's target group are small-scale farmers who have the potential for surplus production.** Better accessibility, visibility, and market access potential, has led GIZ DETA to focus its FFS support on road-connected subsistence farmers. This target group has realistic chances of being linked to local agricultural markets. Over the short to mid-term (i.e. until 2014 and beyond) supported farmers are expected to produce marketable surplus yields.
2. **Most farmers are illiterate.** Illiteracy is widespread among the target group. It is generally higher among women than among men. Some young people have received formal education in exile. However, most of them do not appear to be motivated to take up commercial farming. Slow rates of return from agricultural activities are one of the reasons that adolescents lose interest in agriculture.

Concerning ways to improve GIZ DETA's FFS in Morobo County

1. **There is potential to create training topics and diversify extension methods of GIZ DETA's FFS:** Farm management for market-oriented farming, as well as pest and disease management are two examples of training units that could be intensified in the next FFS season. Farmers have little knowledge concerning these topics. So far very little training has been offered on these topics. In terms of extension methods, it was found that the Training of Trainers (ToT) was too narrowly based on a single knowledge broker. FFS would benefit from exchange visits to additional local knowledge brokers (e.g. to crop training centres, cooperatives etc.). An agricultural radio programme and the inclusion of knowledgeable farmers in the Tot would be further options for farmers to seek information. Didactic methods suitable for adult illiterates could be considered to improve the quality of extension.
2. **Storage facilities for FFS groups and improved post-harvesting have the potential to increase local food availability and to link farmers to the market.** If set up at central road-connected locations, bulk storage facilities could contribute to local food buffer stocks, but also attract traders who will buy and transport bigger quantities of produce to national and regional markets (FAO 2010). Improved post-harvest handling, such as proper drying, shelling and storing ensures that farmers meet crop quality and food safety standards that are pre-conditions for attracting wholesale buyers.

3. **Sufficient time needs to be allowed for FFS service providers to increase their capacity. A long-term knowledge dissemination system cannot be built within just 2 to 3 years.** The lacking resources of the County Agricultural Departments (GOSS) and limited planning horizons of GIZ DETA - as a result of LRRD financing structures - are seen as a potential threat to the long-term durability of existing FFS. Preparing all the required actors for a functioning FFS service system (or any other agricultural knowledge-provision system) requires long-term intervention. A clear agricultural development strategy is therefore needed from DETA for the period beyond 2014. This strategy needs to link the current target group of subsistence-based, small-scale farmers to technical cooperation partners, such as GIZ's "Food Security and Agricultural Development" project (GIZ FSAD).

Concerning the establishment of new FFS in Magwi and Yambio & Nzara County

1. **Repatriation is nearly complete in Magwi County (Eastern Equatoria), whereas the permanent resettlement of returnees has not yet been achieved in Yambio and Nzara County (Western Equatoria).** As a result of recurring attacks by the Lord's Resistance Army, which operates across the South-Sudanese border from the neighbouring Democratic Republic of Congo and Central African Republic, returnees repatriated to southern parts of Western Equatoria have not yet settled permanently. Due to this circumstance, some returnees have become IDPs and many others have not yet left repatriation camps. Within the affected parts of Yambio and Nzara County, it will be difficult for GIZ DETA to transform food-based emergency relief into a FFS approach.
2. **A conflict-sensitive approach is required specifically for Magwi County.** Following repatriation in 2008/2009, the Madi and Acholi people clashed violently over ancestral land titles in 2011. Both tribes need to receive equal support from GIZ DETA.
3. **The initial phase of FFS is to focus on generating quick cash returns.** Ensuring quick cash returns from agricultural activities not only increases farmers' interest in market-oriented production, it also strengthens group dynamics within FFS. GIZ DETA's plan to move into dry season vegetable production is seen as an opportunity to tap people's interest to take up farming as a business.

Zusammenfassung

Kontext

Seit 2008 ist die Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH im Südsudan in Rahmen eines Entwicklungsorientierten Not- und Überganshilfe (ENÜH)-Projektes tätig. Derzeit setzt die GIZ das Vorhaben in den drei Bundesstaaten von Greater Equatoria um. Im Rahmen des Projekts werden Gemeinden, Rückkehrer und intern Vertriebene beim nachhaltigen Wiederaufbau ihrer Lebensgrundlage unterstützt. Nach fast fünf Jahrzehnten Bürgerkrieg steht die neue Regierung des Südsudan (GOSS) vor immensen Herausforderungen. Dazu zählen die Wiederansiedlung von rückkehrenden Flüchtlingen aus dem Ausland, die Diversifizierung einer bislang auf Erdöl basierenden Ressourcenökonomie und die Sicherung des Friedens sowohl mit dem Nachbarn Sudan als auch innerhalb des neuen Staates. Ein Jahr nach seiner Unabhängigkeit befindet sich der Südsudan auf dem vierten Platz der Liste gescheiterter Staaten. Dies verdeutlicht wie dringend notwendig staatsbildende Maßnahmen sind. Aufgrund dieser Tatsache unterstützt die GIZ den Südsudan im Rahmen des ENÜH-Vorhabens. Die vier Projektkomponenten sind Stärkung relevanter Strukturen und Institutionen, landwirtschaftliche Entwicklung, Wiederherstellung zerstörter Infrastruktur und Friedenssicherung. Bezogen auf die landwirtschaftliche Komponente hat das Projekt bislang überwiegend Nahrungsmittel- und Nothilfe geleistet. Da die Rücksiedlung der heimkehrenden Bevölkerung innerhalb des Projektgebietes inzwischen weitgehend abgeschlossen ist, verschiebt sich der Fokus stärker hin zu Übergangshilfe. Für die Regierung des Südsudan spielt der Wiederaufbau des landwirtschaftlichen Sektors in diesem Zusammenhang eine strategisch wichtige Rolle. Über die Hälfte aller SüdsudanesInnen lebt heute in absoluter Armut und über 80% der südsudanesischen Bevölkerung lebt derzeit von der Landwirtschaft. Folglich sind Investitionen in diesen Sektor notwendig um einen Großteil der südsudanesischen Haushalte aus der Armut zu führen, Nahrungsmittelengpässe zu vermeiden und das Land wettbewerbsfähig gegenüber Importen aus den Nachbarstaaten, allen voran Uganda, zu machen.

Seit April 2012 implementiert die GIZ im Rahmen des ENÜH-Vorhabens im Bundesstaat Central Equatoria eine Pilotphase des Farmer Field School (FFS) Ansatzes. Das Ziel der FFS ist es, über Mehrertrag und Einkommensschaffung zur lokalen Ernährungssicherung beizutragen. KleinbäuerInnen sollen sowohl verbesserte Anbaumethoden lernen als auch an marktorientierte Landwirtschaft herangeführt werden. Die vermittelten landwirtschaftlichen Praktiken basieren auf dem LEISA (Low External Input and Sustainable Agriculture) Ansatz. Dieser Ansatz zielt in erster Linie auf Nutzung lokal vorhandener Ressourcen und Produktionsmittel ab und versucht dadurch zu Stabilität und Widerstandsfähigkeit (Resilienz) lokaler Nahrungsmittel-

produktion beizutragen. Zum einen sollen potentielle Ertragssteigerungen die lokale Verfügbarkeit von Lebensmitteln erhöhen. Zum anderen soll die Marktorientierung der Bäuerinnen und Bauern dazu beitragen, Einkommen zu generieren, welches auf Haushaltsebene zur Ernährungssicherung benötigt wird.

Die Studie

Die vorliegende SLE-Studie bewertet die Pilotphase von FFS in Central Equatoria. Zudem untersucht sie Möglichkeiten, den FFS-Ansatz des GIZ-ENÜH-Vorhabens auf die Maßnahmen in den Provinzen Eastern und Western Equatoria auszuweiten. Zu diesem Zweck wurden Daten an drei Standorten erhoben: in Morobo County (Central Equatoria), in Magwi County (Eastern Equatoria) sowie in Yambio & Nzara County (Western Equatoria). Die Datenerhebung folgte einem qualitativen Forschungsansatz. Instrumente für die Datensammlung beinhalteten unter anderem sowohl Fokusgruppendiskussionen mit Bauerngruppen und semi-strukturierte Experteninterviews, als auch Feedback-Schleifen über partizipative Expertenworkshops. Die wichtigsten Ergebnisse werden im Folgenden präsentiert.

Wesentliche Ergebnisse

Zur derzeitigen Situation im Greenbelt

1. **Hunger und Mangelernährung sind in den drei Bundesstaaten von Greater Equatoria weniger stark ausgeprägt als in anderen Bundesstaaten im Südsudan** (WFP 2012). In der Hungersaison, die sich in Central, Eastern und Western Equatoria von Mai bis Juli erstreckt, haben kleinbäuerliche Haushalte in der Regel zumindest eine Mahlzeit pro Tag.
2. **Die Greenbelt Region des Südsudan hat ein enormes, bislang weitgehend ungenutztes landwirtschaftliches Potential.** Der Greenbelt ist traditionell eine Überschuss produzierende Region. Er wird auch als „Brotkorb“ des Südsudans bezeichnet. Zwei Regenzeiten im Jahr sowie unerschlossene Lehmböden machen dieses Gebiet sehr fruchtbar (GOSS 2010). Der Greenbelt hat das Potential die gesamte Bevölkerung des Südsudans mit Nahrungsmitteln zu versorgen (USAID 2009, FAO 2012). Die derzeitig vorwiegende Bewirtschaftung mit traditionellem Regenfeldbau von Subsistenzbauern schöpft dieses Potential bei Weitem nicht aus. Die Landwirtschaft ist gekennzeichnet von veralteten Anbaumethoden und niedriger Produktivität. Der durchschnittliche Getreideertrag liegt bei weniger als 800 kg pro Hektar und Jahr (GOSS 2011).
3. **Die landwirtschaftliche Produktivität der Bauern im Greenbelt ist begrenzt durch niedrigen Intensivierungsgrad. Hingegen ist Zugang zu Land bislang noch kein limitierender Faktor.** Die meisten kleinbäuerlichen Haushalte im Greenbelt bewirtschaften ca 0.4 bis 2.4 ha. Folgende Faktoren beschränken die

Bewirtschaftungsfläche der Bauern auf durchschnittlich 0.8 ha: Bodenbearbeitung per Handhacke, geringe Verfügbarkeit von landwirtschaftlichen Arbeitsgeräten, ein allgemein niedriger Mechanisierungsgrad, begrenztes Wissen zu effizienten Anbaumethoden und hohe Kosten für zusätzliche Arbeitskräfte. Land ist kein limitierender Faktor, da die Bauern in der Regel über traditionelles Landrecht Zugang zu zusätzlichem Land haben. Die Bevölkerungsdichte im Greenbelt ist mit 10 bis 79 Menschen pro km^2 noch immer sehr niedrig (UN-OCHA 2009, FAO 2012).

4. **Es gibt keine Finanzdienstleister, die Kredite für Kleinbauern anbieten.** Die Rücklagen und Sicherheiten von Kleinbauern sind gering. Die meisten Haushalte haben kein finanzielles Kapital das sie investieren könnten, um ihre Produktivität zu steigern. Einkommen, das in der Landwirtschaft erwirtschaftet wird, deckt in der Regel gerade die Grundbedürfnisse und laufende Kosten für Gesundheit, Schulgebühren, usw. Der sich noch entwickelnde Finanzsektor stellt landwirtschaftliche Kredite bislang ausschließlich für registrierte Produzentenorganisationen und Genossenschaften zur Verfügung.
5. **Schlechte Straßeninfrastruktur und hohe Transportkosten schrecken Bauern davon ab, kommerzielle Landwirtschaft zu betreiben.** Der schlechte Zustand von Zubringerstraßen in den landwirtschaftlichen Potentialregionen wie dem Greenbelt, erschwert die Anbindung von Bauern an periurbane Märkte. Ergänzend zur Förderung der landwirtschaftlichen Produktion sind also Investitionen in ländliche Straßen- und Transportinfrastruktur notwendig um die Marktanbindung der Bauern im Südsudan zu stärken (World Bank 2012).

Zu den bereits bestehenden FFS des GIZ-ENÜH-Vorhabens in Morobo County

1. **Die Zielgruppe der FFS des GIZ-ENÜH-Vorhabens sind Kleinbauern mit Potential zur Überschussproduktion.** Aufgrund besserer Zugänglichkeit, größerer Sichtbarkeit und höherem Marktzugangspotential, fokussiert das GIZ-ENÜH-Vorhaben seine FFS-Aktivitäten auf Kleinbauerngruppen mit Straßenzugang. Diese Zielgruppe hat realistische Chancen in einem absehbaren Zeitraum an lokale Märkte angebunden zu werden. Kurz- bis mittelfristig (d.h. bis 2014 und darüber hinaus) wird erwartet, dass die unterstützten Bauern vermarktungsfähige Überschüsse erzielen.
2. **Die meisten Bauern sind Analphabeten.** Die Analphabetenrate unter der Zielgruppe ist hoch. Frauen sind stärker davon betroffen als Männer, Jugendliche hingegen weniger, da sie häufig eine formale Ausbildung im Exil erhalten haben. Jedoch scheinen sie derzeit wenig daran interessiert, kommerzielle Landwirtschaft zu betreiben. Ein Grund für die geringe Motivation sind die langen Wartezeiten, bis Erträge und somit Einkommen generiert werden.

Zu Möglichkeiten bestehende FFS in Morobo County zu verbessern

1. **Potential die Trainingsinhalte und die FFS-Beratungsmethodik zu erweitern ist vorhanden:** Zwei Beispiele von Trainingseinheiten, die in der nächsten Saison intensiviert werden sollten, sind „Betriebsmanagement für markt-orientierte Landwirtschaft“ sowie das Thema „Pflanzenschutz“. Das Wissen der Bauern hierzu ist gering und bislang gab es zu diesen Inhalten nicht ausreichend Weiterbildung. Des Weiteren sollte die Beratungsmethodik der FFS diversifiziert werden. Momentan basiert diese ausschließlich auf dem von einem einzelnen Dienstleister durchgeführten Training of Trainers (ToT) . Weitere Möglichkeiten, den Bauern Zugang zu Wissen und Informationen zu ermöglichen, sind Exkursionen zu Trainingszentren und existierenden Genossenschaften in der Region, der Aufbau eines landwirtschaftlichen Radioprogramms oder die Einbeziehung fortschrittlicher Bauern aus den FFS-Gruppen in dasToT. Eine zusätzliche Ausbildung der Berater zu didaktischen Methoden für Analphabeten sind eine Grundvoraussetzung um die Qualität der landwirtschaftlichen Beratung zu erhöhen.
2. **Lagerkapazitäten für Bauerngruppen und ein verbessertes Nacherntеverfahren sind notwendig, um die lokale Nahrungsmittelverfügbarkeit zu erhöhen und Bauern an den Markt anzubinden.** Gruppenlagerhäuser an zentralen, leicht zugänglichen Orten (z.B. entlang der Hauptstraßen) können nicht nur einen Beitrag für lokale Ausgleichslager gegen Nahrungsmittelengpässe leisten, sondern auch Händler anziehen. Dies ermöglicht den Bauern Anschluss an nationale und regionale Märkte zu finden (FAO 2010). Verbesserter Nachernteschutz wie beispielsweise sorgfältiges Trocknen, Schälen, Reinigen oder richtiges Einlagern der Ernte, kann dazu beitragen, dass Bauern Qualitätskriterien erfüllen und somit Großhändler beliefern können.
3. **Die Stärkung zentraler Dienstleister braucht Zeit. Ein FFS-Dienstleistungssystem, das längerfristig Bestand haben soll, kann nicht innerhalb von 2 bis 3 Jahren aufgebaut werden. Es sollte also genügend Zeit eingeplant werden.** Fehlende Ressourcen der lokalen, staatlichen Landwirtschaftsbehörde und der begrenzte Planungshorizont eines ENÜH-Vorhabens, welcher sich aus Laufzeitbegrenzungen des ENÜH-Finanzierungstitels ergibt, werden als Hindernisse für die Nachhaltigkeit der aufgebauten FFS bewertet. Der Aufbau eines funktionierenden FFS-Dienstleistungssystems mit allen benötigten Akteuren, erfordert ein längerfristiges Engagement. Das GIZ-ENÜH-Vorhaben sollte daher eine schlüssige landwirtschaftliche Strategie erstellen, die über das eigene Projektende im Jahr 2014 hinausgeht. Diese Strategie muss die bestehende Zielgruppe aus Subsistenzbauern an längerfristige technische Vorhaben anbinden,

beispielsweise an das GIZ “Food Security and Agricultural Development”-Projekt (GIZ-FSAD).

Zur Gründung von neuen FFS in Magwi und Yambio & Nzara County

1. **Während die Wiederansiedlung von Rückkehrern in Magwi County (Eastern Equatoria) weitestgehend abgeschlossen ist, wurde eine endgültige Wiederansiedlung von Rückkehrern in Yambio & Nzara County (Western Equatoria) noch nicht erreicht.** Aufgrund anhaltender grenzüberschreitender Übergriffe durch die Lords’ Resistance Army (LRA), die aus der Demokratischen Republik Kongo und aus der Zentralafrikanischen Republik agiert, konnten Rückkehrer in südlichen Regionen von Western Equatoria noch nicht endgültig wiederangesiedelt werden. Einige der Rückkehrer sind zu intern Vertriebenen geworden; viele andere leben noch immer in Rückkehrerlagern. In den betroffenen Regionen von Yambio & Nzara County sind aufgrund dieser Zielgruppenkonstellation für das GIZ-ENÜH-Vorhaben bei der Umgestaltung des bestehenden Not- und Nahrungsmittelhilfeansatz in einen FFS-Ansatz besondere Herausforderungen zu erwarten.
2. **Konfliktsensibles Vorgehen ist insbesondere in Magwi County nötig.** Nachdem die Rücksiedlung 2008/2009 weitgehend abgeschlossen war, kam es 2011 zu gewaltsamen Auseinandersetzungen um Ansprüche auf traditionellen Landbesitz zwischen rückgesiedelten Mitgliedern der Madi- und Acholivolksgruppen. Beide Ethnien müssen die gleichwertige Unterstützungsleistung vom GIZ-ENÜH-Projekt erhalten, um ein Wiederaufflammen des Konfliktes zu vermeiden.
3. **Die erste Phase der FFS sollte darauf ausgerichtet werden, es den teilnehmenden Bauern zu ermöglichen schnell Einkommen zu erwirtschaften.** Die Möglichkeit durch landwirtschaftliche Aktivitäten schnell Einkünfte zu erzielen, kann das Interesse an marktorientierter Landwirtschaft erhöhen. Schnelle Erfolge stärken auch die Dynamik der FFS-Gruppen. Der Plan des GIZ-ENÜH-Vorhabens Gemüseanbau in der Trockenzeit zu verbreiten, wird als eine gute Möglichkeit gesehen.

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Abbreviations

AA	Auswärtiges Amt / Federal Foreign Office
AAH	Action Africa Help
AAO	Agricultural Advisory Organization
AESA	Agroecosystem Analysis
BEW	Boma Extension Worker
BMZ	German Ministry for Economic Development and Cooperation
CAD	County Agricultural Department
CBA	Community Based Approach
CBO	Community Based Organisation
CAN	Calcium Ammonium Nitrate
CEC	Cation Exchange Capacity
CES	Central Equatoria State
CIA	Central Intelligence Agency
COM	Commission of the European Communities
CPA	Comprehensive Peace Agreement
CRS	Catholic Relief Service
CTC	Crop Training Centre
DAC	Development Assistance Committee of the OECD
DAP	Di-Ammonium Phosphate
DED	former Deutscher Entwicklungsdienst now GIZ
DETA	Development-Oriented Emergency and Transitional Aid
DFID	Department for International Development
DIE	Deutsches Institut für Entwicklungspolitik / German Development Institute
DRC	Democratic Republic of the Congo
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EES	Eastern Equatoria State
e.g.	for example
ENÜH	Entwicklungsorientierte Not- und Überganshilfe
ERAP	Equatoria Region Agriculture Program
ESÜH	Entwicklungsfördernde und Strukturbildende Übergangshilfe
FAO	Food and Agriculture Organisation

FFS	Farmer Field School(s)
FG	Farmer Group(s)
FNS	Food and Nutrition Security
FSAD	Food Security and Agricultural Development
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GOSS	Government of South Sudan
GWA	Ground Working Activities
Ha	Hectare
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
ICIPE	International Centre of Insect Physiology and Ecology
IDP	Internally Displaced People
i.e.	that is
IFDC	International Fertilizer Development Center
IGA	Income Generating Activities
IPM	Integrated Pest Management
ISRIC	World Soil Information
JFFS	Junior Farmer Field School
KCB	Kenya Commercial Bank
LEIA	Low External Input Agriculture
LEISA	Low External Input Sustainable Agriculture
LRA	Lord's Resistance Army
LRED	Local and Regional Economic Development
LRRD	Linking Relief, Rehabilitation and Development
M+E	Monitoring and Evaluation
MoA	South Sudanese Ministry of Agriculture
NAFA	Nzara Farmers Association
NGO	Non Governmental Organization
No.	Number
NPA	Norwegian People's Aid
NRCS	Natural Resources Conservation Service
NSB	National Bureau of Statistics
OECD	Organisation for Economic Cooperation and Development

OCHA	Office for the Coordination of Humanitarian Affairs
PEW	Payam Extension Worker
PICD	Participatory Integrated Community Development
PME	Planning, Monitoring and Evaluation
PRA	Participatory Rural Appraisal
PTD	Participatory Technology Development
RDAA	Rural Development Action Aid
SDG	Sudanese Pound
SLE	Seminar für Ländliche Entwicklung (Centre for Advanced Training in Rural Development)
SNV	Stichting Nederlandse Vrijwilligers (Netherlands Development Organisation)
SPCRP	Sudan Productive Capacity Recovery Programme
SPLA	South Sudanese People Liberation Army
SSCCSE	Southern Sudan Centre for Census, Statistics and Evaluation
SSP	South Sudanese Pound
SSLDP	South Sudan Livelihood Development Project
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TEEB	The Economics of Ecosystems and Biodiversity
TOR	Terms of Reference
ToT	Training of Trainers
US	United States of America
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	US Agency for International Development
USD	US Dollar
USDA	United States Department of Agriculture
WES	Western Equatoria State
WFP	World Food Programme
WFP P4P	World Food Programme Purchase for Progress
YAFA	Yambio Farmers Association

1 South Sudan – The Newest Country in the World

1.1 Background and Problem Description

After more than five decades of almost continuous war, South Sudan became independent on 9 July 2011. The first step in South Sudanese history was to form a nation of 10.6 million inhabitants (CIA 2012). Building a functioning state from more than 60 indigenous ethnic groups (OCHA 2009) will be the task for the decades to come.

Ranked fourth on the list of the world's failed states (The Fund for Peace 2012), the challenges are diverse. Amongst the most important are the establishment of long-term peaceful relations with Sudan, the reintegration of almost two million refugees, bringing about good governance, further sub-national development planning and strengthening society-state relations. Another urgent need is the diversification of the economy, of which 98% depends on oil revenue. Despite the relatively high oil wealth, 51% of the South Sudanese live below the poverty line (Worldbank 2011) and about 80% are small-scale farmers.

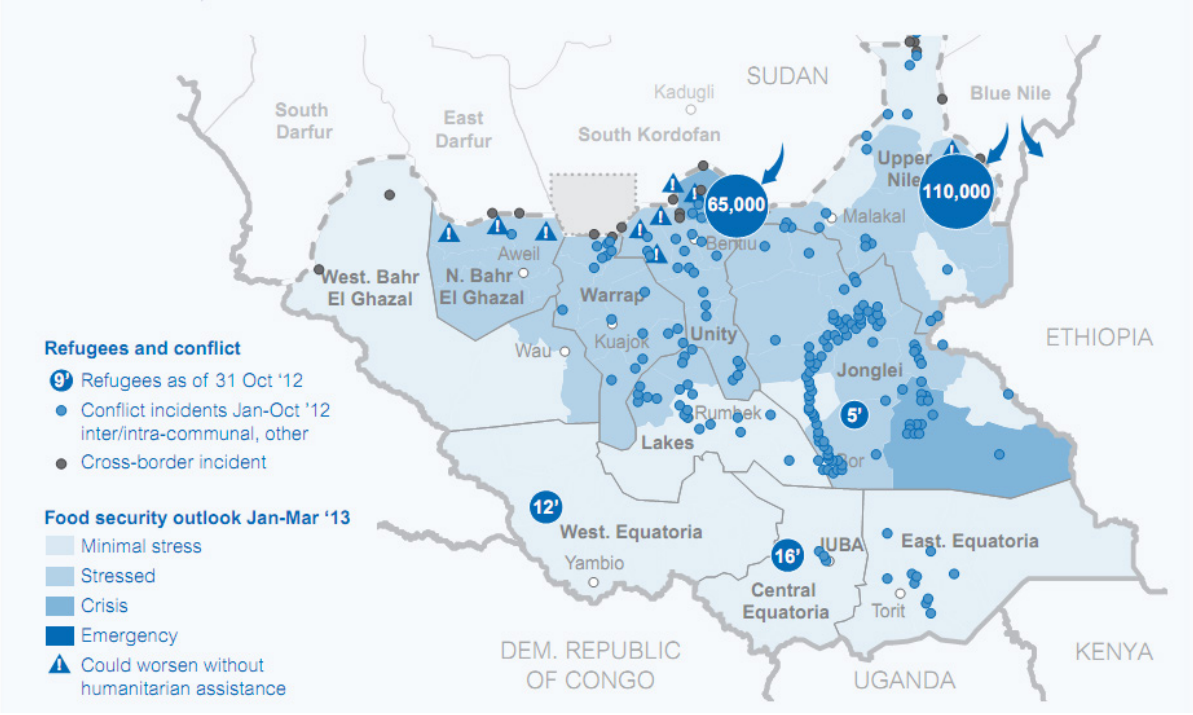

Figure 1: The connection between conflict, refugees and food security (OCHA 2012)

Despite the high percentage of farmers, the production and productivity of the agricultural sector is very low and food security is a major challenge. In 2012 the number of people requiring food assistance rose from 1.2 to 2.4 million (OCHA 2012). Figure 1: The connection between conflict, refugees and food security (OCHA 2012) shows that particularly the northern and eastern parts of South Sudan are affected by food

insecurity. Main reasons are erratic rainfall, insecurity, inflation, and border closures with Sudan (OCHA 2012). Figure 1 also shows the links between conflict, refugees and food security. The northern and eastern states that are particularly affected by intercommunal conflicts and refugees also have a higher prevalence of food insecurity. Nevertheless, the southern states, Western, Central and Eastern Equatoria are less affected.

1.2 The GIZ DETA Project in South Sudan

In order to provide assistance in this situation, the "Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH" (GIZ) has been operating in South Sudan since 2008 with a Development-Oriented Emergency and Transitional Aid (DETA) project. The overall objective of GIZ DETA is:

> *"In selected counties of Central and Eastern Equatoria, the food deficit of food-insecure population groups is temporarily alleviated and a contribution is made to the sustainable improvement of livelihoods"* (GIZ 2012a).

The project operates with four major components. Component 1 focuses on institution building, component 3 on infrastructure rehabilitation and component 4 on peace building. All prior components are interlinked and take part in achieving component 2, which focuses on agricultural development.

The target group consists of "returnees and the local population" (GIZ 2012a). However for project implementation there is no distinction, both groups are small-scale farmers. The method chosen for agricultural extension is the Farmer Field School (FFS) approach, which is a rather informal way to disseminate agricultural input and knowledge. The following project outputs are defined:

- Innovative FFS for peer learning are set up;
- The County Agriculture Department (CAD) extension service is strengthened to service the FFS;
- The crop production of farmers and farmer groups (FG) is increased, respectively; and
- The marketability of surplus offered by farmers or FG is improved to generate income (GIZ 2012b).

GIZ DETA currently supports 100 farmer groups (FG) with approximately 2000 small-scale farmers in Morobo, Magwi, and Yambio & Nzara County with agricultural input and specialised training (GIZ 2012b). In April 2012, GIZ DETA started a pilot FFS phase in five payams within Morobo County in Central Equatoria State (see Figure 1).

The strategic objectives and measures of the GIZ DETA project in Morobo County in the mid-term are to improve existing FFS and potentially setting up new FFS. The

long-term objective is to hand over the FFS project to the community. In two other project locations, namely Yambio & Nzara County in Western Equatoria and Magwi County in Eastern Equatoria State (see Figure 2), the FFS approach shall also be implemented if the conditions are suitable.

Almost the entire project region is located within the Greenbelt Region of South Sudan (the green area in Figure 2) which has favourable agro-ecological conditions for agricultural production (see chapter 4.1 for detailed information). In order to reach the above-mentioned goals in a more concise way, the setup of a Greenbelt Program is planned in the midterm future.

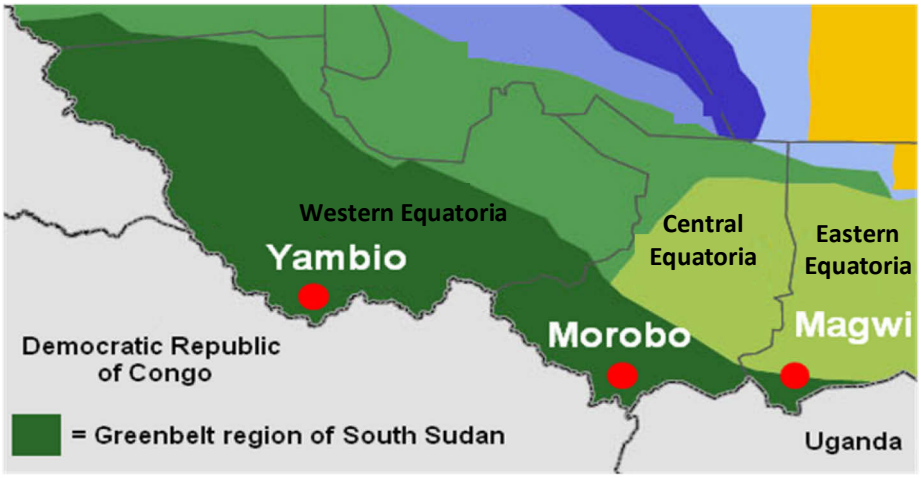

Figure 2: Greenbelt region of South Sudan and GIZ project locations (fews.net 2009)

1.3 Current Situation in South Sudan

Historical Background

South Sudan fought for independence from Sudan in two extensive civil wars from 1955-1972 and from 1982-2005. Africa's longest civil war caused more than two million casualties and roughly four and a half million people were displaced. (Ali et. al 2005). The signing of a Comprehensive Peace Agreement (CPA) in 2005 was followed by a referendum in January 2011 in which 98.83% voted for the separation of South Sudan from Sudan (Southern Sudan Referendum Commission 2011).

Political Situation

Shortly before independence, the Southern Sudan Legislative Assembly ratified a transitional constitution. Twenty-nine ministries and ten state governments were established and the new country has already begun to reach out to regional partners and organisations such as the African Union (UNDP 2011). For an overview of the different administrative levels in South Sudan see Figure 3. The state level is like that of the federal state in the United States of America (USA). The county is, as in the

USA, the next administrative level followed by the payam and the boma which is comparable to townships in the USA.

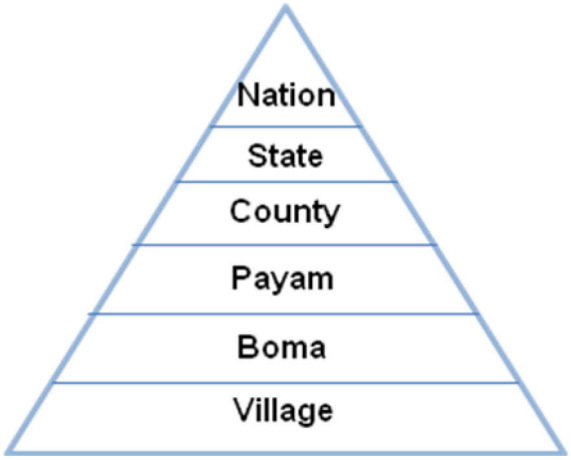

Figure 3: Administrative levels in South Sudan

Despite the progress that South Sudan has already made, there are still a lot of state-building challenges to face. After two generations of war and the displacement of more than two million people, the main problems are a so-called "capacity gap" (UNDP 2011) and a lack of resources. Ministries lack *"sufficient qualified staff and nearly half of all civil servants in South Sudan only have primary education"* (UNDP 2011: p.1). This fact was also observed for the project regions visited by the study team. The majority of staff from the County Agricultural Department (CAD) does not have adequate agricultural knowledge and for example has no means of transport to fulfil the extension service tasks. At state level, no concise state strategy for agricultural development has been created. Lastly, corruption based on ethnic group lines is widespread.

Social Situation

As mentioned above, South Sudan hosts over 60 ethnic groups with different languages and cultures. The two dominant tribes are the Dinka and the Nuer. Those two groups were heavily engaged in the second civil war for independence. John Garang, a Dinka, founded the South Sudanese People Liberation Army (SPLA) and after he died in 2005, his successor Salvar Kiir Mayardit also a Dinka, became the first president. The vice-president, Riek Machar, is a Nuer. Both groups provided the majority of "freedom fighters" during the civil war and therefore rewarded those fighters with powerful political positions. Most of the Dinka and Nuer live in the northern parts of South Sudan and are pastoralists. The southern part is populated mainly by small-scale farmers, especially the Greenbelt region. The interests of these small-scale farmers are therefore not well represented at state level. The clash of these two different cultures, pastoralists and farmers, is a major challenge for social cohesion in the future. Within the project regions the following ethnic groups are present: In

Morobo County, Lubwara and Kakwa; in Magwi County, Madi and Acholi; and in Yambio & Nzara County, Azande, Baka, and Mundu (OCHA 2009).

Economic Situation

According to the figures, South Sudan has a GDP of 2100 USD per capita (CIA 2012) which means that on average the whole population lives on 5.75 USD per day. This is clearly above the poverty line. In reality, 51% of the population live below the poverty line of 1.25 USD per day (NSB 2012) and some predict a rise of up to 83% in 2013 (Conflict Risk Network 2012). 78% of South Sudanese earn their livelihood from agriculture. The productivity of this sector is still very low. 70% of the total land area in South Sudan is suitable for crop production but only 4% is currently cultivated. The average value of production is 299 USD per ha compared to 665 USD in Uganda and 1,405 USD in Kenya in 2009 (World Bank 2012a).

Gaining 98% of its revenue from oil, South Sudan is a classic Rentier state, deriving "*a large fraction of its revenues from external rents"* (Ross 2001: p.329). Scientific research suggests that *"resource wealth itself may harm a country's prospects for development"* (Ross 2001: p. 328). The country's elite does not urgently need to elaborate a diversified economy where wealth is generated from taxing its citizens. But employment is important for social cohesion, especially in South Sudan where the population is very young. 51% are under the age of 18 and 72% are under the age of 30 (World Bank 2012b).

The diversification of the economy is the task for the future and agriculture should play an important role in this (GOSS 2010). But the average annual growth rate of the agricultural sector between 1990 and 2000 was 10.6 % and declined to 3.6 % between 2000 and 2008 (World Bank 1009). Here the above mentioned gap between the pastoral and farming cultures may play a role: whereas the pastoral Dinka and Nuar elite may live from oil revenue and livestock, the south urgently needs support in the farming sector.

Agricultural Context Including Background of South Sudan's Greenbelt Region

South Sudan is divided into six agroecological zones: the "Arid Belt", the "Flood Plains", the "Hills and Mountains", the "Ironstone Plateau", the "Nile-Sobat Corridor" (also known as: Al Sudd), and the "Greenbelt" (see Figure 4).

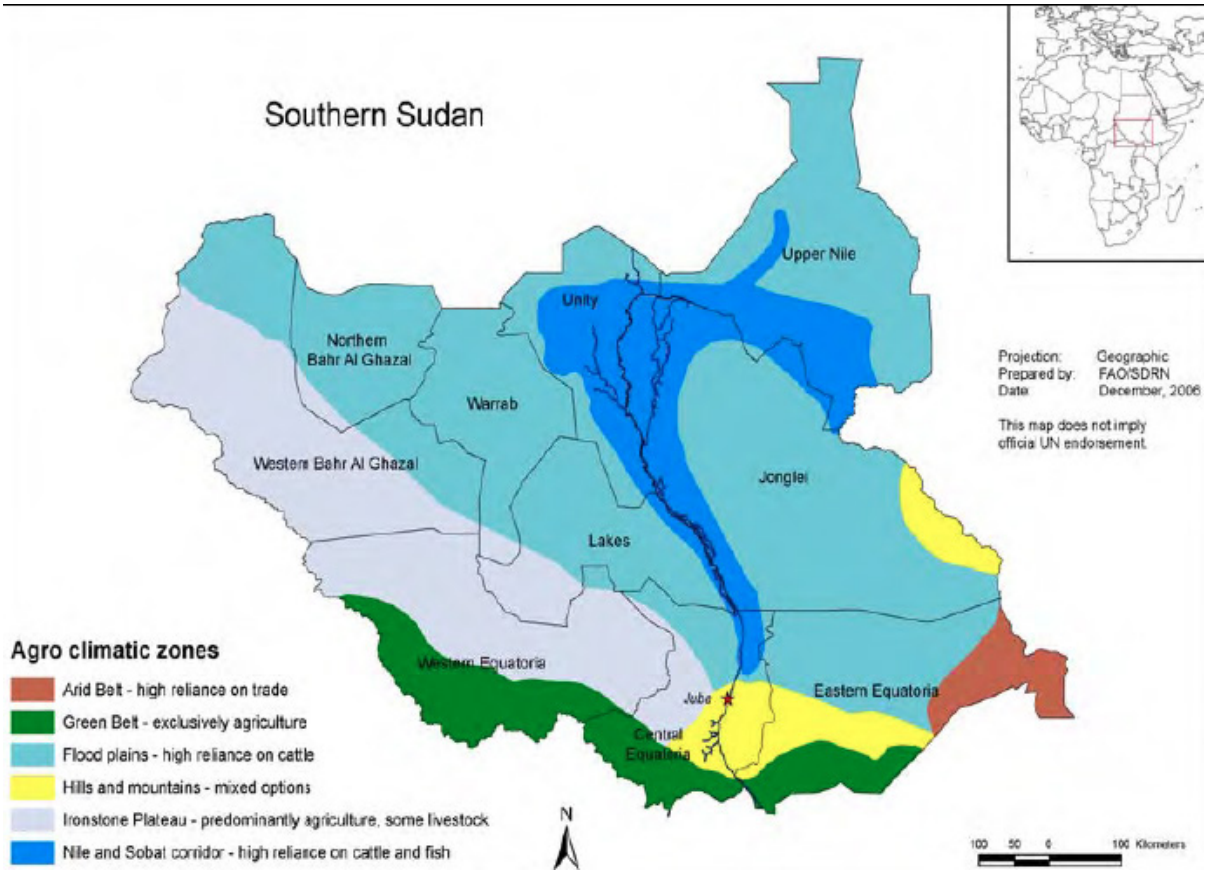

Figure 4: Agro-ecological Zones of South Sudan (USAID 2009)

The Greenbelt Zone

The Greenbelt Zone represents the most fertile cereal growing area of South Sudan. It stretches across Western, Central, and Eastern Equatoria State and is a traditional surplus-producing agricultural region, also known as the 'bread-basket' of South Sudan. Farming practices applied by farmers in the "Greenbelt area" are based on traditional and low yielding methods. Cereal yields are on average below 800 kg per ha (GOSS 2011). The agricultural potential of the area has not yet been tapped. The Greenbelt is endowed with extensive natural resources, namely humid tropical forest cover, which is supported by a deposit of heavy fertile clay soils. The Greenbelt has a bimodal rainfall of around 1100-1600 mm (SSCCSE 2007, WFP 2012; see Figure 5).

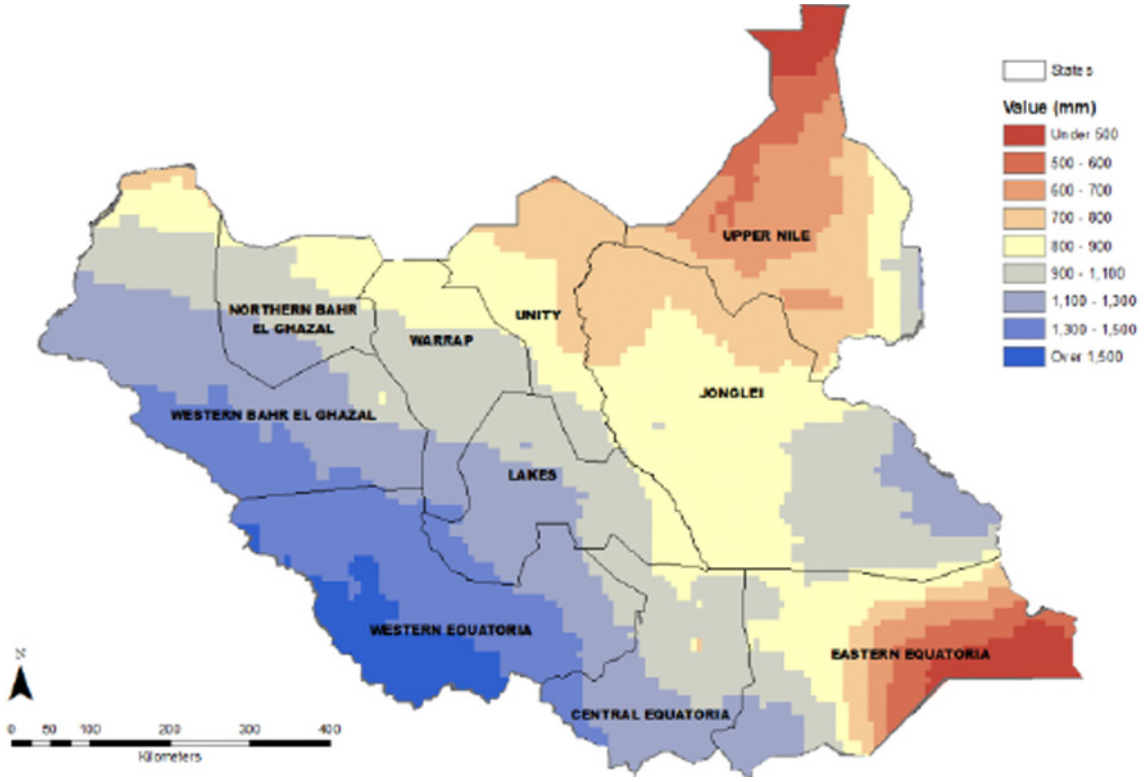

Figure 5: Bimodal Rainfall of 1100-1600 mm/year in the Greenbelt Zone (WFP 2012)

Agronomic practices are characterised by low productivity and rudimentary cropping techniques such as shifting cultivation and seed broadcasting. Cultivation consists mainly of rain-fed traditional subsistence agriculture. This is performed predominantly by small-scale farmers (average field size 0.8 ha). Most Bomas (villages) within the Greenbelt are very remote and hardly developed. A few indicate promising performance and fewer still prosper due to better infrastructure development within the peri-urban vicinity. Farming practices adopted in different locations differ according to spatial differentiation in resource availability and physical infrastructure. Households in the south west of the Greenbelt Zone rely almost exclusively on arable farming to meet their food needs where surplus production is common.

The most important staple food crops are sorghum, maize, groundnuts, sesame and cassava. Other crops include millet and several varieties of beans. Most of these crops are grown in both the first and second season. In the past, the Greenbelt had a number of large-scale tea and coffee plantations that are no longer operational due to the war. Fruit, sugarcane, tobacco and teak trees are also considered to be cash crops. Sesame, sorghum and soya bean surpluses are even exported to Uganda (GIZ 2012b). Opportunities to export agricultural produce exist with the neighbouring crop-deficit zones within Uganda. However, transporting this surplus is highly constrained by the extremely poor road network. This discourages farmers from producing as much as they potentially could. Apart from crop sales, poultry, honey and fruit

(e.g. mangoes, oranges, pineapples and lemons) provide additional sources of cash. The main wild foods available include yams, palm trees, shea butter, and termites. Wild game includes dik-diks, gazelles, and monkeys.

Agricultural Potential and Strategies for Development

The following chapter outlines the agricultural strategies from different actors.

Table 1: Different actors' agricultural strategies for South Sudan

Government of South Sudan (GOSS 2012a)	**FAO Strategy** (FAO 2011)
• "Experience from other countries around the world has shown that GDP growth from agriculture has been twice as effective at reducing poverty as GDP growth originating from other sectors" • "Increase cereal crop production, from a benchmark of 0.695 million metric tonnes (Mt) to above 1 million Mt per year." • "Increase of production and market supply of fish from a baseline of 40,000 to 100,000 Mt by 2013"	• "Balance emergency response to save lives with longer-term recovery to mitigate food insecurity and ensure sustainable agricultural development" • Input distribution • Livelihood diversification • Technology transfer • Conservation Agriculture • Adaption strategies to climate change
GIZ FSAD (GIZ (2012j)	**USAID** (USAID 2012)
• "Strengthen a commercial approach to farming and market linkages" • Development of value chains and a domestic commercial agro-processing body • Create market intelligence • Foster institution building • Develop networks, create platforms • Start activities on research and quality assurance	• "Help the new nation market and attract private capital and investors in key sectors, including agriculture" • Increase agricultural trade • Commercial farming inputs • Establish seed companies, agro-dealers, commercial famer-based organizations • Consolidators who can both provide inputs to improve productivity and serve as extension agents

To attract foreign investors the South Sudanese Ministry of Agriculture (MoA) presented a concept that focused on the following topics (Ayul 2010, GOSS 2012b):

- "South Sudan's top priority is to attract commercial cereal farmers and millers"
- Cash crops: coffee, tea, gum acacia, high value fruits and vegetables, floriculture
- Strategic cornerstones: equipment leasing and dealers, agricultural input dealers (seeds and fertilisers), financial services, industrial businesses, packaging materials, factories e.g. for canning, infrastructure (feeder roads, storage facilities), research and training

Besides this economic focus the GOSS published a series of drafted sector policies for seeds, plant protection, mechanisation, research and training.

Table 1 shows the different agricultural development priorities in South Sudan. However, the GOSS lacks a concise agricultural strategy that leads to a rather undefined area of intervention. There are no regular coordination meetings between the actors. Synergy effects are not used and there is a risk of long-term collective interests being overruled by short-term individual interests.

Land grabbing was not recorded within the research area but according to a study by Norwegian People's Aid (NPA), 9% of South Sudanese land has already been bought by foreign investors (NPA 2011).

1.4 Fragile Statehood

As mentioned above South Sudan was ranked fourth on the list of the world's failed states (The Fund for Peace 2012). But what is the implication of this classification? On the one hand, we can confirm a clear paradigmatic shift in the discourse of development cooperation. From 1990 and especially after September 11th 2001, with the rise of global terrorism the global poor are not only seen as needy but also as dangerous for international security. On the other hand new emerging phenomena could be analysed in a more comparative way. The Fund for Peace does not give a single sentence to define a failed state but measures each state according to ten indicators, namely: demographic pressure, refugees and IDPs, group grievance, human flight, uneven development, poverty and economic decline, legitimacy of the state, public services, human rights, security apparatus, factionalised elites, external intervention (Fund for Peace 2012). South Sudan scores very high in almost every aspect.

What does this mean in reality? To give a more concrete definition and to focus more on the consequences of fragility on the area, we shall also present the approach of a publication of the "German Development Institute" (DIE). Here fragility is conceptualised through certain aspects of statehood, namely state authority, state capacity, state legitimacy (DIE 2012). The poorer a state performs in these aspects, the more fragile the state is rated. The consequences of fragility are:

- **Weak state authority** leads to a loss of monopoly on violence, leading to the privatization of violence and in turn leading to ordinary citizens having more experience of violence in their everyday lives.
- **Low state capacity** means a weak delivery of social services and poor administration structures on behalf of the state. This leads to poor education, poor protection from diseases and increases the danger of negative externalities.
- Finally, the **less legitimate** a state, the weaker state-society relations. This weakens authority and capacity since no relevant taxes-for-services system can be established.

The DIE study grouped Sudan[1] together with Chad and the Democratic Republic of Congo in a cluster with the largest deficiencies (DIE 2012).

What consequences does fragility have on development cooperation? To make development cooperation more effective in fragile states the OECD defined 10 principles for good engagement in fragile states. Some principles are, for example, "prioritise prevention", "do no harm" or "avoid pockets of exclusion" (OECD 2007). The German Ministry for Economic Development and Cooperation (BMZ) has published the "Entwicklungsorientierte Transformation bei fragiler Staatlichkeit und schlechter Regierungsführung" concept in accordance with the OECD principles (BMZ 2007).

The OECD carried out a survey to monitor international engagement in South Sudan in 2011, measuring the application of the 10 principles. The report found potential in every principle, criticising for example the *"pervasive and destructive impact of corruption"*, *"the lack of statistics and other basic planning data"* and stating that *"there is no effective formal donor coordination agreement"* (OECD-DAC 2011: p.12).

Which concrete consequences are relevant here for the GIZ DETA project? Since South Sudan is a highly fragile state, the 10 OECD principles are relevant for GIZ DETA project planning and implementation. See chapter 3.4 for opportunities and limitations of the GIZ DETA FFS approach in the fragile context of South Sudan.

[1] The respective study worked with data from 2007-2009 when South Sudan was still part of Sudan. Nevertheless, the general trend after the separation is still similar to that period.

2 The Study

2.1 Objectives

The objectives of the study are agreed upon in the Terms of Reference (TORs, see Annex 1) and are basically two-fold. On the one hand, the study conducts an assessment of existing FFS in Morobo County, Central Equatoria State (see Figure 2). In particular, the study aims to find out whether the chosen FFS' content and methods are tailored to the farmers' needs and the situation on the ground. On the other hand, the study examines the adaptability of the FFS methods and techniques to the two GIZ DETA locations in Yambio & Nzara and Magwi County (see Figure 2).

With regards to the **FFS assessment in Morobo County**, the following tasks are in the focus of analysis according to the TORs:

- Compilation of additional, relevant agro-ecological / biophysical environment data (according to available data) with a focus on agricultural production
- Data collection and summary description of farming systems and common agricultural practices that exist in the region, based on a Farming System Analysis
- Data collection and summary of socio-economic characteristics of farm-households and their social environment (based on "sustainable livelihood analysis") including examples (not comprehensive) and a cost-benefit analysis of the smallholders' livelihood-farming system in form of profit margins
- Stakeholder / partner and target group analysis
- Evaluation and identification and description of best practices of FFS methods including Training of Trainers (ToT) modules (e.g. on technical topics such as soil fertility, intercropping, crop diversification, crop intensification, restoring degraded land, biodiversity and ecosystem protection)

With regards to the **adaptability of the FFS methods and techniques to Magwi and Yambio & Nzara County**, the following tasks are the focus of analysis:

- Summary of agro-ecological data / biophysical environment (according to available data) with a focus on relevant data for agricultural production
- Data collection and summary description of farming systems and common agricultural practices that exist in the region (Conway1985, Darnhofer et al 2012)
- Data collection and summary of socio-economic characteristics of farm-households and their social environment (based on "sustainable livelihood analysis") including examples (not comprehensive) and a cost-benefit analysis of the smallholders' farming systems

- Analyses of potential stakeholders and target groups to be involved in the DETA programme

Finally, recommendations shall be given for best practices and potential for the introduction (adaptation) of FFS methods from Morobo County to Magwi and Yambio & Nzara County and for the strategic planning of the Greenbelt programme (GIZ 2012c).

In order to verify that the FFS approach has been effectively implemented, context factors as well as vulnerability criteria are included in the analysis. The study area consists of the respective Payams of Morobo, Magwi, and Yambio & Nzara County (see Figure 2). Table 2 integrates the different level objectives into a logical framework. See chapter 3 for further explanations of the study approach and methodology.

Table 2: Objectives of the Study

<table>
<tr><td colspan="3">Impact: The measures of GIZ and partners contribute towards increasing agricultural production among smallholders within South Sudan’s Greenbelt Region in a sustainable way</td></tr>
<tr><td>Outcome 1
GIZ-DETA and partners use the results of the study to improve the implementation of the FFS approach in a needs-based way</td><td>Outcome 2
GIZ-DETA and partners use the results of the study for planning their measures in Magwi and Yambio & Nzara County</td><td>Outcome 3
GIZ-DETA and relevant partners use the results of the study for their strategic planning</td></tr>
<tr><td colspan="2">Output 1
A situation analysis is available for Morobo, Magwi, and Yambio & Nzara County. The Situation Analysis consists of a reduced and adjusted Livelihood-, Farming System- and Stakeholder Analysis</td><td rowspan="3">Output 6
Conclusions for GIZ’s strategy development for the Greenbelt Programme based on the other outputs of the study are available and jointly reflected with relevant stakeholders</td></tr>
<tr><td>Output 2
An analysis and assessment of FFS is available for Morobo County</td><td>Output 4
An analysis and assessment is available for the transferability of FFS to Magwi and Yambio & Nzara County</td></tr>
<tr><td>Output 3
Recommendations are available for improvements of the existing FFS approach in Morobo County</td><td>Output 5
Recommendations are available for the transferability of the FFS approach to Magwi and Yambio & Nzara County</td></tr>
</table>

2.2 Relevant Concepts

2.2.1 Farmer Field Schools Approach and Training of Trainers

Definition and Key Objectives of FFS Approach

> *"Farmer field schools (FFS) are described as a Platform and "School without walls" for improving the decision-making capacity of farming communities and stimulating local innovation for sustainable agriculture. It is a participatory approach to extension, whereby farmers are given the opportunity to make a choice in the methods of production through a discovery-based approach."* (Kisha 2004: p. 6)

The approach is used to teach agricultural techniques and management skills that improve farmers' knowledge gaps and make them experts on their own farms.

> *"The objective of FFS is to build farmers' capacity to analyse their production systems, identify problems, test possible solutions and eventually adopt the practices that are most suitable to their farming systems. The knowledge acquired during the learning process enables farmers to adapt their existing technologies to be more productive, profitable and responsive to changing conditions, or to test and adopt or adapt new technologies."* (Bwalya 2007)

As opposed to other instruments / methods of agricultural extension, such as training and visits, or group-based demonstration plots, FFS shall create a space for Participatory Technology Development (PTD) to enfold (Sustainet 2010). FFS promote technology generation from the "bottom-up", using local resources, local knowledge and local deliberation for development. The basic idea of the FFS approach is to create a space in which a prolonged and concentrated exchange of innovations (ideas and technologies) can be fostered among participating farmers.

Structure and Organisation of a FFS

Table 3 highlights essential components of a FFS and how it is characterised.

Table 3: Elements and characteristics of FFS

Essential elements of a FFS	Characteristics of the FFS approach
• The group • The field • The facilitator • The curriculum • The programme leader • Financing (Sustainet 2010)	• Farmers as experts • The field is the place of learning • Extension workers as facilitators, not teachers • Subject matter specialists "work with" rather than "lecture" farmers • Interdisciplinary curriculum (e.g. crop and animal husbandry) • Training follows the seasonal cycle • Regular group meetings • Learning materials are learner generated • Group dynamics / team building (Kisha 2004)

A typical FFS group consists of about 15-30 participants who meet regularly in a group field to discuss and/or experiment. The topics usually covered are production- and marketing-related problems. Each FFS group is supervised by a facilitator who contributes knowledge on state-of-the-art technologies or business models. The original concept foresees the facilitator being one of the members of the farmer group. He/she receives training from a master trainer (see Figure 6). Facilitators play a crucial role. He/she is supposed to understand the level of the farmers' pre-existing knowledge and deliver his/her own expertise in a dynamic way. The facilitator then analyses the situation and looks at how to tackle them jointly with farmers.

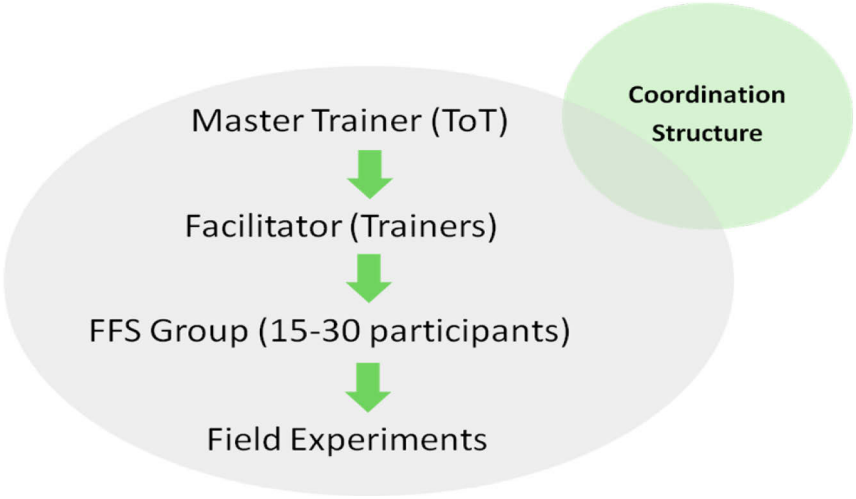

Figure 6: FFS training structure

Steps in Conducting FFS

The initial concept of how to establish and run a FFS is described in Figure 7. **Ground working activities** (GWA) are preparatory activities that need to be done before establishing a FFS, such as identifying the priority problem and selecting FFS sites. For further details see the FFS assessment criteria in chapter 3.

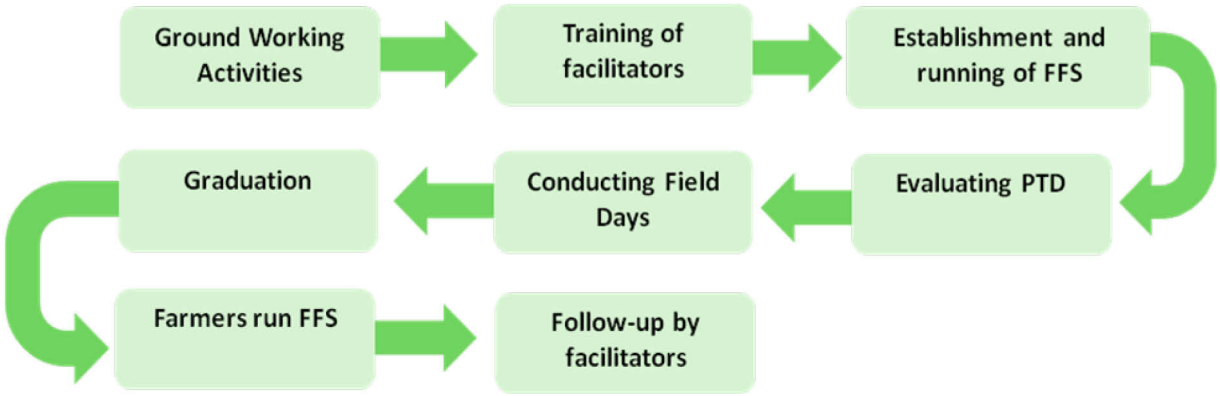

Figure 7: Steps in conducting FFS (based on Sustainet 2010)

During **field days** the group presents what they have learned to non-FFS-participants. They usually take place while the FFS are still running. Participants graduate at the end of a season or, if FFS are planned for more seasons, at the end of the training cycle. They then, hold the knowledge and confidence to **run their own FFS**. This is the basis for scaling-up the approach.

2.2.2 Linking Relief, Rehabilitation and Development

GIZ DETA in South Sudan is following the Linking Relief, Rehabilitation and Development (LRRD) approach. Figure 8 shows the different stages of a classic LRRD approach. GIZ DETA started with emergency food aid in 2008, continues to use cash for work and food for work measures, and has now proceeded to technical cooperation with a "Greenbelt programme" that is to be implemented in the future.

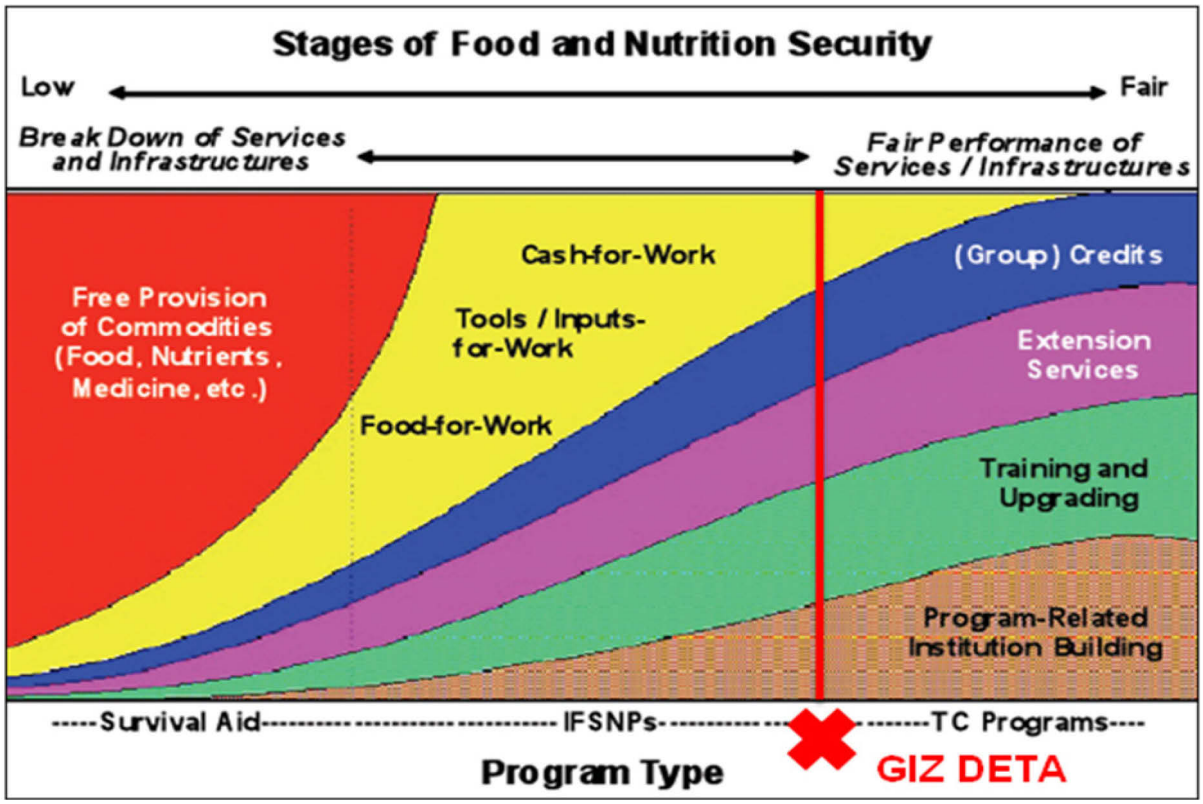

Figure 8: Transition from relief to rehabilitation and development (GIZ 2012d)

With its beginnings dating to the 1980s, the LRRD concept tries to define the transition between humanitarian assistance and development cooperation.

Table 4 highlights exemplary differences of the two intervention strategies.

Obviously both strategies have deficiencies according to their primal rationale. Relief mechanisms do not take into account long-term development issues. Development policy is often not prepared well enough to cope with natural disasters, conflicts and other crises. The previous approach of a continuum, where humanitarian aid is clearly demarcated from and followed by development cooperation, has often been inef-

fective. Since post-conflict situations frequently tend to fall back into conflict again, a contiguum is more effective, where different instruments of both approaches are used in an overlapping and complementary way.

In a fragile post-conflict context like South Sudan the situation may change suddenly, making humanitarian/survival aid necessary again. Sticking to an LRRD approach, GIZ DETA keeps various instruments at its disposal to address various stages of food and nutrition security. The study team ranked the GIZ DETA project in the last third of the LRRD spectrum (Figure 8).

Table 4: The two approaches that LRRD integrates (COM 2001)

	Humanitarian assistance	**Development cooperation**
Time perspective	Short-term	Long-term
Implementing partners	Non-governmental and international organisations	Administration of partner countries
Role of national authorities	Low – to ensure immediate impact	High – due to relationship of state building and development
Content of interventions	Needs of individuals affected by crises	Autonomous development policies and strategies

2.2.3 Resilience

Resilience is an antonym for “vulnerability” and **relates to improvements in people’s livelihood assets** (DFID 1999). It measures the stability of a social-ecological system when confronted with stresses or shocks (Adger 2000).

Strategies to increase the resilience of small-scale farmers include increasing their productivity to improve their buffer capacity, and to strengthen farmers’ organisational and self-learning capacities (Neubert et al 2011).

Increased productivity refers to increasing the output of valued product per unit of resource input (Conway 1998). In relation to small-scale farmers productivity can be increased by improving agronomic practices in terms of labour and natural resource efficiency. Productivity can also be increased by improving marketing opportunities for crops (GTZ Sustainet 2006). Increased productivity is measured by an increase in farmers’ financial capital.

Improved buffer capacity describes an improved ability of a farming household to absorb social, economic, or environmental changes before the household’s livelihood options collapse (Adger 2000). An example of increased buffer capacity would be crop diversification. Farmers planting different types of crops have more than one way to sell their products: If a pest or disease destroys one crop, or if the price for a

certain crop is down, the other crop species are still there to compensate (Neubert et al 2011). Improved buffer capacity is measured by an increase in the farmers' natural, physical, social or financial capital.

Higher degree of organisation refers to the ability of individuals to organise themselves with others, or to network and cooperate with an institution (Darnhofer 2009). A farmer may, for example, participate in a FFS, which may become a producer cooperative selling products at better market conditions. Through regular exchange with extension workers, the FFS group may also be able to communicate community-based development priorities to local government authorities. A higher degree of organisation increases farmers' governance by increasing their social and political capital.

Higher adaptive capacity of individual farmers refers to improvements in the self-learning capacity of farmers(Neubert et al 2011). To give an example, field visits of FFS to important information brokers in the area can strengthen the capacity of individual farmers to search for knowledge and information in the absence of a functioning agricultural extension system. Agricultural radio programmes delivered to the rural poor are another example that achieves the same effect. Increasing farmers' self-learning capacity increases their human capital.

2.2.4 Food Security

Food security is a concept that has evolved over time. According to a currently accepted definition, 'Food Security' is achieved within a location when:

> *"All people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life."* (FAO 2000)

IFPRI (1999) lists approximately 200 definitions and 450 indicators of food security. Holistic definitions, such as the one by Gross et al (1998) or InWent (2009) combine **Food and Nutrition Security** (FNS) emphasising 'Use and Utilisation' of food, not just 'Availability' and 'Accessibility'. Figure 9 highlights the main components of FNS.

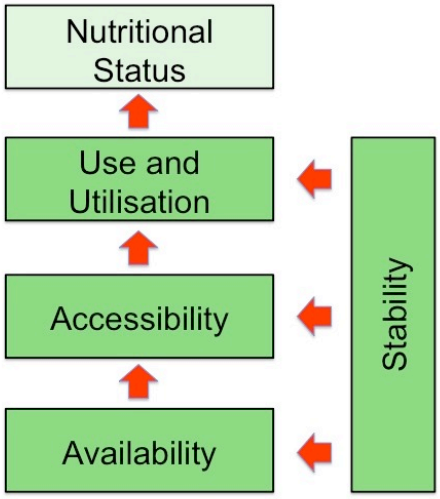

Figure 9: Components of FNS (InWent 2009)

Availability refers to the physical existence of food, be it from own production or in the markets. Whether or not enough food is available can be determined, aside from household production, by the market supply that originates from the combination of domestic food stocks, commercial food imports, food aid, and domestic food production.

Accessibility is ensured when all households and all the individuals within those households have sufficient resources to obtain appropriate food for a nutritious diet (Riely et al 1995). The resources necessary to gain access to food are food production, income for food purchases, or in-kind transfers of food (whether from other private citizens, national or foreign governments or international organisations).

Use of food refers to decisions within the household concerning the types of food to be purchased, prepared, and consumed (demanded). Use also refers to decisions on how the food is allocated within a household.

Utilisation refers to the biological aspect of food intake, i.e. an adequate diet. The latest interpretation of utilisation also considers a healthy physical environment, including safe drinking water and adequate sanitary facilities (to avoid disease) and an understanding of proper healthcare, food preparation and storage processes.

Stability refers to the temporal dimension of nutrition security; it equates to sustainability, or the time frame over which food security is being considered.

Use and Utilisation, Accessibility, Availability of food and the **Stability** of these three elements can **differ at the Macro, Meso and Micro level** within a country. For example, food may be available in a certain region (e.g. within the Greenbelt for South Sudan) but not in the whole country. It may be available in the whole country but not among discriminated populations. Respectively, the seasonality of food avail-

ability and utilisation (due to cyclical events of drought or disease) may be a rural but not an urban phenomenon, etc. (For more details see: InWent 2009, GIZ 2012d).

2.2.5 Sustainable Agriculture

> *"The ultimate goal or the ends of sustainable agriculture is to develop farming systems that are productive and profitable, conserve the natural resource base, protect the environment, and enhance health and safety, and to do so over the long-term. The means of achieving this is low-input methods and skilled management, which seek to optimize the management and use of internal production inputs (on-farm resources) in ways that provide acceptable levels of sustainable crop yields and livestock production and result in economically profitable returns."* (Rao et al 2008)

The concept of sustainable agriculture is intimately linked to the concept of resilience. Sustainable agriculture seeks to ensure the stability of agricultural production over a long-term temporal dimension (Conway 1998). The overall purpose of sustainable agriculture is to protect income opportunities for farmers (GIZ 2012e), nutritional security (GTZ Sustainet 2006), and environmental services for future generations (IAASTD 2009, Rockström 2009, UNEP 2009, TEEB 2010). More specifically, sustainable agriculture refers to a set of technologies that address problems affecting conventional agriculture. Such problems include the loss of soil productivity from excessive soil erosion and associated plant nutrient losses, the pollution of surface and ground waters from pesticides, fertilisers and sediments, impending shortages of non-renewable resources, as well as low farm income from depressed commodity prices and high production costs (Conway and Barbier 1990, Lockertz & Anderson 1990, Reijntjes et al 1992, Altieri 1995).

Table 5 presents agricultural technologies that have a high potential for improving the resilience of farming systems.

Table 5: Agricultural technologies with high potential for sustainability

Technology	Description
Intercropping	The growing of two or more crops simultaneously on the same piece of land. Benefits arise because crops exploit different resources. They can also mutually interact with one another: If one crop is a legume it may provide nutrients for the other. If one crop covers the soil better than the other it may reduce competition from weeds. There are also combinations that can deter pests.
Rotational Cropping	The growing of two or more crops in sequence on the same piece of land. Benefits are similar to those arising from intercropping.
Green Manuring	A form of improved fallow cropping in which legumes are grown in order to fix nitrogen. Deliberate incorporation of mature legumes into the soil to replenish soil nutrients for the following crop.
Use of Animal Manure	The recycling of animal dung as crop manure. This requires "zero grazing" barns, which allow the farmer to collect large amounts of manure on farm. Preparation of compost from crop and animal

	biomass allows farmers to replenish soil nutrients needed by the following crop.
Rotational Grazing	Intensive grazing systems in which livestock is taken out of the barn to be rotated in high herd densities on open pasture. This reduces the need to collect manure. Manure is directly applied to the field before the cultivation of the next crop.
Use of Fertiliser	The informed use of organic and/or inorganic fertilisers requires knowledge of the types and concentrations of nutrients to be applied. This requires access to scientific soil assessments. Intensification of production reduces spatial expansion. This helps to protect wild natural resources and associated ecosystem services of watershed protection, climate regulation, soil protection, and biodiversity conservation.
Agroforestry	A form of intercropping in which annual herbaceous crops are grown interspersed with perennial trees or shrubs. The deeper-rooted trees can often exploit water and nutrients not available to the annual crops. That means the trees, if chosen correctly, can recycle nutrients and water from deeper soil layers to make them available to the crops. The trees may also provide fodder for livestock, fruits for human consumption, or wood fuel and timber, thus taking pressures off wild natural resources.
Conservation Tillage	The use of minimum tillage or no-tillage, in which the seed is placed directly into the soil with little or no preparatory cultivation. This reduces the amount of soil disturbance and thereby lessens the erosive effects of crushing soil colloids, compaction, run-off and corresponding loss of sediments and nutrients. A soil and water conservation method that maintains soil structure.
Integrated Pest Management	The use of all appropriate techniques of controlling pests in an integrated manner that enhances rather than destroys natural controls. If pesticides are part of the programme, they are used sparingly and selectively, so as not to interfere with natural enemies. The same applies if biological controls are part of the programme.
Appropriate Irrigation Technologies	The use of easy to use, easy to repair, and water-saving irrigation equipment. It can be combined with the agronomic use of wetlands during the dry season to extend crop production into the hunger season of subsistence-based farmers.
Crop Diversification	The cultivation of poly-cultures (an antonym for specialisation). The simultaneous cultivation of many different species of crop on the farm helps to offset consumption shortfall in the face of sudden massive shocks, such as disease outbreak or unexpected market failure affecting specific (cash) crops in the field. The simultaneous cultivation of a variety of crops minimises the risk of having nothing to sell or to eat. It is a strategy used among subsistence-based farmers.
Seed-Saving of Open Pollinated Varieties	The saving, storing, selection, and replanting of crops from one year to the next. Using open pollinated varieties ensures ready access to seeds and seedlings by income-poor farmers, many of whom cannot afford to buy new seeds (improved or otherwise) every season.

3 Research Approach and Methodology

3.1 Research Approach

The focus of the research was to assess the pilot phase of the FFS approach implemented by GIZ DETA in the Greenbelt. Based on the findings of the FFS assessment and a supplementary situation analysis, recommendations for the potential improvement of the existing FFS in Morobo County and the establishment of the approach in Magwi and Yambio & Nzara County were developed. On this basis, recommendations were drawn up for future strategy development to be carried out by GIZ DETA. The situation analysis included an identification of farming systems of small-scale farmers, a partial livelihood analysis, an analysis of the vulnerability context and a stakeholder analysis of GIZ DETA's project component 2.

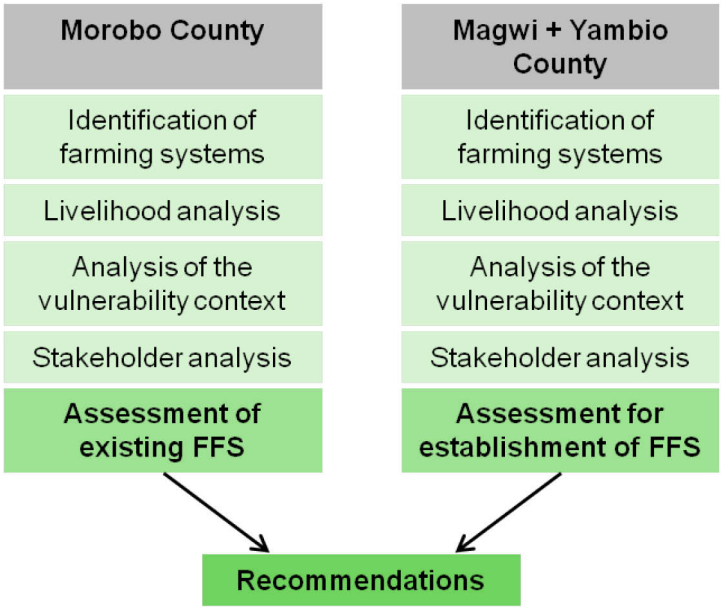

Figure 10: Study approach

The situation analysis was tailored to supplement the FFS assessment. **Central research questions** were developed respectively. For example, to identify existing farming systems, two central research questions have been established (for the complete list of central research questions, see Annex 10):

➔ What do small-scale farmers' production systems look like?

To answer this question, local agricultural production systems were identified and classified according to the goal of the production system (predominantly serving subsistence versus market needs). The market access conditions, the agricultural techniques employed and the necessary farm-based workforce were also investigated.

➔ What knowledge do small-scale farmers have on sustainable agricultural practices?

To answer this question, current practices employed on local farms of FFS groups were compared with GIZ DETA's training objectives in order to identify possible entry points for further training, based on farmers' needs and present knowledge gaps.

For the assessment of existing FFS in Morobo County, a more specific set of **assessment criteria** was developed based on different sources (e.g. Kisha 2004). The following criteria were included in the assessment of FFS performance (for a complete list see Annex 11):

- Ground working activities
  - All necessary steps before implementing a FFS
  - Selection of suitable sites, farmers, and facilitators
- Appropriateness of content and methods
  - Assessment of needs and abilities of farmers
  - Alignment of project measures to the definition of sustainable agriculture
- Long-term success of the FFS approach
  - Checking for the existence of a viable long-term strategy
  - Investigation of organisation, structure, willingness and commitment of farmer groups
- First impacts / successes
  - Farmers implement agricultural techniques and practices on their plots.
  - Economic impacts (e.g. increase in income)

Based on these assessment criteria and the results of the data collection and analysis for Morobo County, a set of **establishment criteria** has been developed for the assessment of the situation in Magwi and Yambio & Nzara County. The following criteria were included in the assessment of establishment needs for new FFS (for a complete list see Annex 12):

- Logistical support and adequate resources of GIZ DETA
  - Adequacy of project staff in terms of numbers and background
  - Current project management, organisational structure, and resources
- Actors' landscape
  - Identification of stakeholders
  - Implications for GIZ DETA's FFS project
- Potential roles of GIZ DETA and other actors for the implementation of FFS
  - Identification of necessary services

  - Identification of potential service providers
- Ground working activities (GWA)
  - Status quo of necessary GWA
  - Availability of adequate logistical resources for GWA
- Factors for long-term success
  - Motivation, organisation and structure of farmer groups
  - Support from local authorities

3.2 Methodology

A qualitative research approach backed up by an analysis of secondary data was applied. This took into account the following research objectives:

- To fill in data gaps and assess problems and potential to improve FFS and
- The need for efficiency and inexpensive methods in the given context.

In order to successfully carry out the different types of analyses outlined in chapter 3.1, the following data collection methods were applied:

- **Semi-structured interviews** with stakeholders involved in the FFS approach at all levels, as well as with key persons and experts from the agricultural sector, other relevant stakeholders and individual farmers from the groups visited for the situation analysis;
- **Focus group discussions** with FFS groups and facilitators, mainly for the assessment of the FFS approach implemented by GIZ DETA and situation analysis, as well as with other local farmer groups acting as control groups for the situation analysis;
- **Participatory Rural Appraisal (PRA)-methods** with FFS groups and other farmer groups for the situation analysis:
  - **Seasonal calendar** to learn about changes in livelihood activities of small-scale farmers over the year, mainly concerning farm activities and farmers' vulnerability context;
  - **Income expenditure matrix** to identify farm and non-farm sources of income of small-scale farmers and their potential as well as expenditure patterns;
  - **Services and opportunities map** focusing on agricultural production to explore the spatial availability of services and market opportunities for small-scale farmers.

  For a detailed description of the PRA methods applied refer to Kumar (2002).

- **Exemplary profit margins** calculated with data from the Agricultural Advisory Organization (AAO) and Keliko farmers association for some of the region's most important food crops, to assess their potential to generate income;
- **SWOT-analysis** to assess strengths, weaknesses, opportunities and threats of the current FFS approach in the given context;
- **Secondary data analysis** to acquire a theoretical background and supplement and triangulate the empirical findings; and
- **Workshops** with key persons to cross-check the research approach, preliminary results and discuss recommendations.

As gender is a crucial issue in food security (BMZ 2011a), all methods were carried out including gender aspects as a cross-cutting issue. This means that gender-sensitive data was gathered wherever suitable; e.g. the income expenditure matrix was carried out separately for men and women.

Figure 11 explains the study team's methodological approach.

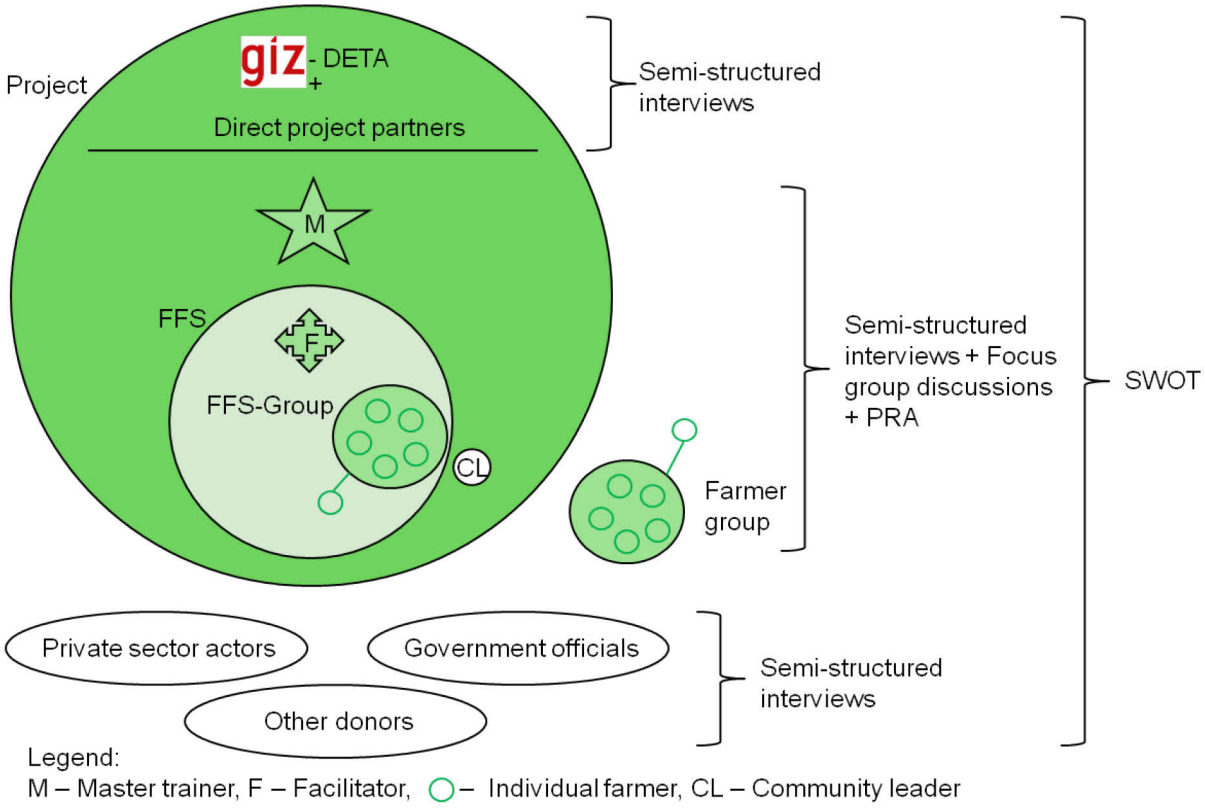

Figure 11: Simplified model of SLE's methodological approach

Respondents of the qualitative interviews in Morobo County included key resource persons who are familiar with the existing FFS approach and the agricultural sector in the region. These resource persons included GIZ DETA staff, local government authorities (CAD), the master trainer organisation (AAO), and other important

stakeholders (e.g. GIZ FSAD, local farmers associations, and traders). For a complete list of key resource persons and interviewed experts please refer to Annex 3.

The study team visited ten out of the thirteen existing FFS in Morobo County. The groups were chosen based on the following criteria:

- Geographic location e.g. remote location vs. road connection and market access;
- Specialisation e.g. in vegetable production or agro-forestry;
- Women and youth groups; and
- Reasons of practicability, such as which day the group meets in the week.

Three control groups were chosen for the following reasons:

- Kenza, because the group was formerly a GIZ DETA FFS but dropped out – to investigate the possible reasons why they dropped out;
- Killi Killi farmer group, because it has never been supported by the FFS approach; and
- Angaliri Farmers Association Society, because it is a registered cooperative and a member of the local Keliko Farmers Association – to assess potential for the future development of FFS groups.

In total ten individual FFS members were interviewed. From the control groups a total of eleven individual farmers were interviewed. Eight of them were members of farmer groups and three members of the Kenza group that dropped out. Two of the individual farmers were women and nine were men. The individual farmers were mainly chosen due to accessibility criteria and their willingness to participate. Thus, they do not necessarily act as a representative sample of small-scale farmers in the region.

Respondents of the qualitative interviews in Magwi County included key resource persons who are familiar with the agricultural sector in the region, including GIZ DETA staff, the local partner government (CAD), a potential master training organisation (Palotaka Seed Centre), and other important stakeholders (e.g. Stichting Nederlandse Vrijwilligers, SNV). For the complete list of key resource persons and experts interviewed, see Annex 3.

The study team visited seven out of 40 farmer groups at five sites supported by GIZ DETA. Five of the visited groups were from the Acholi corridor and two from the Madi corridor. The visited groups were chosen by local agricultural staff of GIZ DETA Magwi. Group selection was based on the following criteria:

- High potential to become a FFS;
- High motivation of the group; and
- Accessibility.

In total, 22 individual farmers were interviewed. Thirteen of the individual farmers were women and nine were men. The individual farmers were mainly chosen as a result of their willingness to participate in group interviews. Thus they do not necessarily act as a representative sample of small-scale farmers in the region. The triangulation of their answers did however provide a good indication.

Respondents of the qualitative interviews in Yambio & Nzara County included key resource persons who are familiar with the agricultural sector in the region, including GIZ DETA staff, the local partner government (Nzara CAD), potential master training organisations (Rural Development Action Aid (RDAA) and Ragozere Agriculture Training Center), and other important stakeholders. Some of them had previous experience with FFS and organisations that run FFS in the region (e.g. FAO and World Vision). Three progressive farmers who are potential candidates to become facilitators were interviewed. For a complete list of interviewed key resource persons and experts, please refer to Annex 3.

The study team visited four existing farmer groups supported by GIZ DETA, two in Yambio and two in Nzara County. The groups were chosen by local GIZ DETA staff. Selection was based on the following criteria:

- High potential to become a FFS;
- High motivation of the group; and
- Accessibility.

In total 23 individual farmers were interviewed, including the three progressive farmers. The individual farmers were mainly chosen as a result of their willingness to participate during group interviews. Thus they do not act as a representative sample of small-scale farmers in the region.

3.3 Data Analysis

Detailed notes were taken for all the qualitative methods carried out. In the first step, the data was systematically collected in Microsoft Excel worksheets. Next, relevant information was summarised in the Excel worksheet according to each research question and extracted for data analysis. Data analysis was then guided by the main research questions, the FFS assessment criteria and the establishment criteria outlined in chapter 3.1. The results were further discussed with relevant actors (e.g. GIZ DETA staff, government officials and actors involved in the FFS training sessions). Based on these results, recommendations were given for the improvement of existing FFS, the transfer of the approach to Magwi and Yambio & Nzara County, as well as for future strategy development by GIZ DETA. All conclusions and recommendations were both presented to relevant actors in a final workshop.

3.4 Limitations

The limitations of the study include the following:

- **External constraints:** Data collection was subject to limited time in the field, deficient infrastructure in the study region, that the rainy season coincided with the field phase, and the long distances to travel. To ensure the best possible results, sample sizes were small but focused. Accordingly, the findings of the study are not statistically representative but are instead informed assertions based on triangulated anecdotal evidence.
- **Limited access to interviewees:** Interview partners such as FFS groups, individual farmers and experts had a limited amount of time to contribute. A few people could not be interviewed even though the study team made every effort to meet them. This means that not all the information could be gathered exhaustively. Nevertheless, overall data is sufficient for the intended analyses, with the exception of the intended exemplary cost-benefit analysis of small-scale farmers' livelihood options in terms of farming systems potentials. Exemplary profit margins for crops were calculated, however.
- **Limited data availability:** Data on HIV/AIDS was only available for Morobo County. For Magwi and Yambio & Nzara County no such data was accessible. The subject cannot therefore be analysed thoroughly.
- **Translation:** The study team worked with local translators, most of them experts in the field of agriculture. Nevertheless, a loss of information during translation has to be considered.
- **Risk of enforcing conflicts with the recommendations of the study:** In the study region the situation regarding conflicts is complex and of high risk. The study team is aware of the fact that the recommendations given in the study could have an effect on the course of possible or existing conflicts (e.g. if recommendations would have favoured one ethnical group). Hence recommendations were screened and adjusted carefully so as not to enforce conflicts (support dividers) but rather, wherever possible, to act as strengthening connectors – based on the "Do No Harm" principle.

4 Results for Morobo County

4.1 Situation Analysis

4.1.1 Target Group

The target group of GIZ DETA's FFS interventions comprises small-scale subsistence farmers who have potential for surplus production (see Figure 12). Specific support is provided to farmers who have road connections. These farmers have a realistic chance of being linked to local and national markets. Road-connected farmers are likely to contribute to increased national food production in the short to mid-term future. Small-scale subsistence farmers in remote and isolated areas are not yet the focus of project interventions due to inaccessibility and the short run of the project. It is harder to link them to local markets within the given project frame.

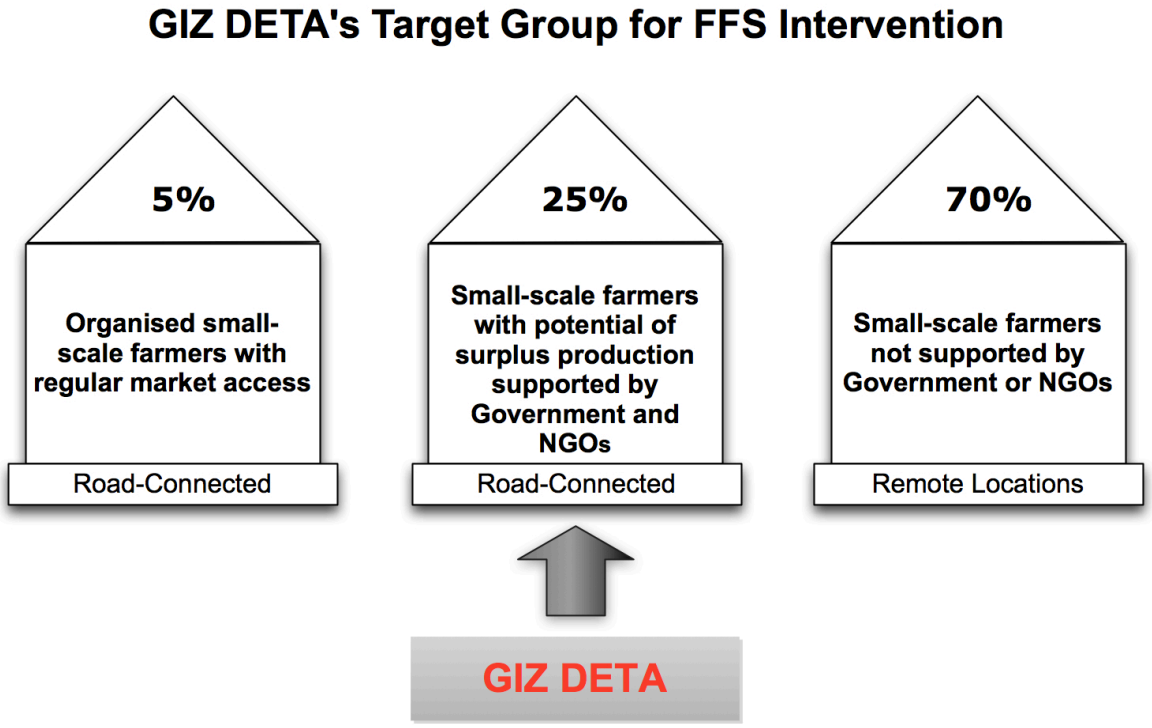

Figure 12: Composition of small-scale farmers for project intervention[2]

In Morobo County, GIZ DETA supports 13 FFS demonstration sites. These sites offer training possibilities for 26 farmer groups comprising a total of 452 members. 166 of the participants are women. Returnees found within these FFS groups have been

[2] Own production: estimates of percentages based on expert interviews with AAO, Keliko Farmers Association, and agricultural advisors of GIZ DETA, Morobo County, August 2012

repatriated from neighbouring Uganda (Börgel 2009). Repatriation occurred between 2005 and 2009[3].

4.1.2 Farming Systems

Agro-ecological Conditions

Altitude: Morobo is situated on a highland plateau at 1,219 m above sea level. It has an undulating relief, featuring hills and depressions, but few mountainous valleys.

Rainfall: With an average, annual precipitation of 1,552 mm and 108 rainy days per year there is reliable rainfall in Morobo[4]. Figure 13 shows the rainfall's bimodal distribution over the year, which means that there are two rainy seasons.

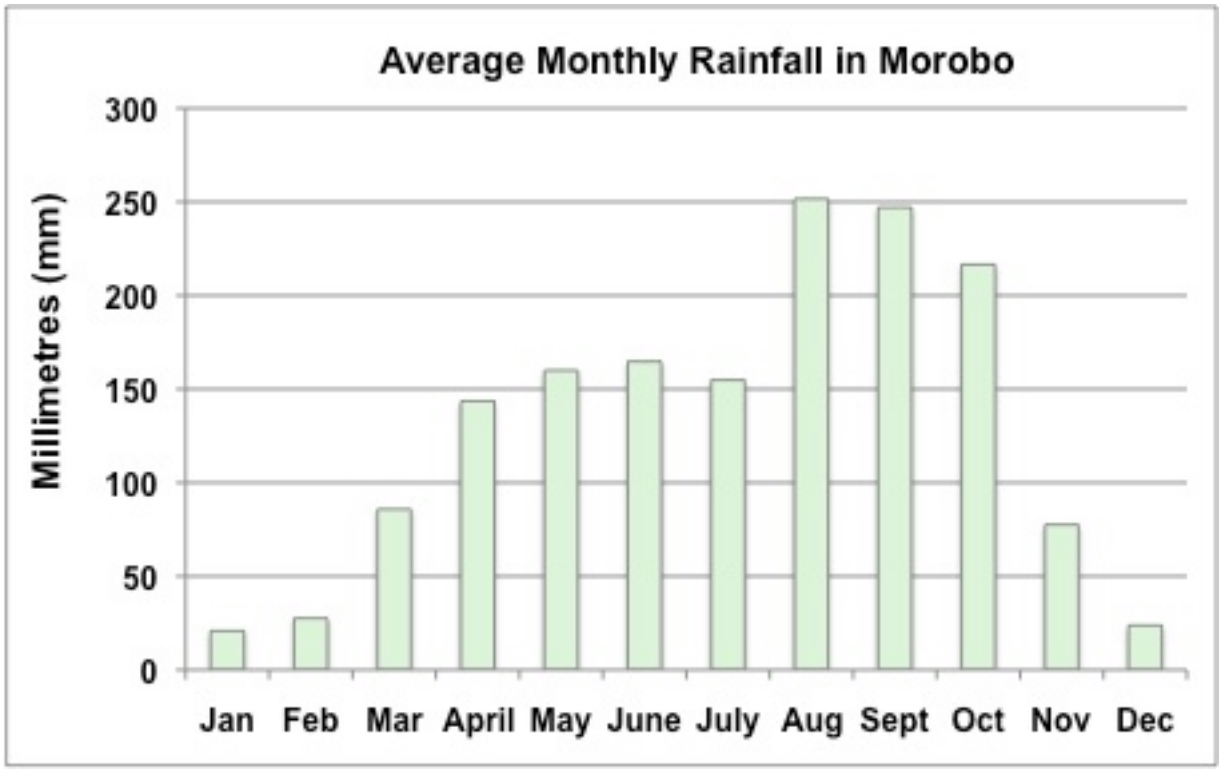

Figure 13: Monthly rainfall in Morobo town: 5 year averages for 2007-2011[5]

The first rainy season extends from March/April to July. The second rainy season extends from the end of August to October/November.

These periods coincide with two major growing seasons for the local farmer. Rainfall in Morobo is at its highest in the second rainy season (August-October), which repre-

[3] Expert interview with agricultural advisors of GIZ DETA, Morobo County, August 2012
[4] Based on rainfall data from 2007-2011 from AAO, Morobo County, 23/10/12
[5] Expert interview with AAO, Morobo County, 23/10/12

sents the last harvest of the year (November/December) from which farmers have to subsist until July (see Figure 14).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dry season												
Rain Season												
Most annual crops*												
Tobacco												
Sugarcane												
Cassava												
Coffee												
Vegetables												
Fruit				Mangos						Citrus		
Wild Game												
Honey												
Fish												
Agricultural labour												
Trade & Exchange	P								P			
Crop sales		P								P		P
* Maize, Sorghum, Simsim,					Planting							
Groundnuts, Beans, Sweet					Harvesting							
Potatoes, Millet, Rice, Soy Beans					P = Peak							

Figure 14: Seasonal calendar of agricultural production in Morobo (adapted from: SSCCSE 2007)

Soils: Soils in Morobo County are classified as “plinthic ferrasols” (Odero 2008), which belong to USDA’s soil family of “Oxisols” (McGregor 2008). Oxisols are the most common soil type of the humid tropics (McGregor 2008). These soils have profiles that are deep and mostly well-drained. They are reddish to yellowish in colour and are characterised by relatively little horizon differentiation. Oxisols tend to be found on flat or gently sloping terrain. They support a vegetation of deep-rooting shrubs and trees (McGregor 2008). In Morobo County, soil texture is dominated by loamy clay[6]. Agriculturally, this means that the soils are heavy and manually arduous to work on. However, the structure of Oxisols is well-suited to agriculture. For a detailed description of soils in the Greenbelt, please refer to Annex 13.

Typical Food and Cash Crops

Cassava, maize, and sorghum have been mentioned as the most important staple food crops among farmers in Morobo County. Maize is preferred to cassava for taste. Sorghum is appreciated for its nutritional value. Compared to cassava or maize, fewer kilograms of sorghum are able to satisfy daily calorific needs[7].The advantage of cassava, by contrast, is that no external storage preparations are needed for the

[6] Expert interview with AAO, Morobo County, 05/08/12

[7] Expert interview with GIZ DETA agricultural advisors, Morobo County, August 2012

crop. When Cassava is ripe and ready for harvest, it can be left in the soil without going bad. Farmers can therefore harvest cassava whenever it is needed for consumption. This makes cassava a valued food crop in the lean season, when farmers' food stores have run empty.

In terms of cash crops, cassava, maize, beans, and groundnuts consistently ranked at the top across all groups. Other products that are lucrative on the market are onions, cabbage, sorghum and bananas[8]. Products with a high demand in local markets but are less commonly-grown are coffee, honey, and timber in terms of tree products. Further products that have a high yet largely untapped market potential are Irish potatoes, sesame, fish and rice[9]. Farmers mentioned that they required further agronomic and market-oriented training to generate income from these crops.

Cash crops that ranked consistently low in their income-generating potential are avocado, millet, pumpkins, papaya, yams, passion fruit, cucumber, amaranths, sweet potatoes, carrots, and okra. Surprisingly, tomatoes, citrus fruits, and mangos also ranked in this category[10]. For more details, please refer to the chapter on **Farmers Knowledge** and **Market Access** below.

Market Potential of the Most Important Food Crops

The study team has calculated exemplary profit margins for some of the most important food crops of the region to give an insight into which crops have a high potential to generate income. Information on costs and revenue has been collected from the AAO and Keliko farmers associations. For detailed figures, please see Annex 18.

Generally, the figures show an enormous potential to generate income with food crops in the study region. For both AAO and Keliko, profit margins of vegetables are very high, particularly those of onions and tomatoes. According to Keliko, one feddan (0.42 ha) of tomatoes generates a profit margin of 5,280 SSP (1,777 USD[11]). AAO even secures more than 17,000 SSP (5,723 USD) with one feddan. Very good profit margins have been also achieved with cabbage, beans, cassava and rice. Table 6 gives a simplified example of the calculation of important crops profit margin of AAO.

[8] Result of income expenditure worksheets conducted with FFS groups, Morobo County, August 2012
[9] Result of income expenditure worksheets conducted with FFS groups, Morobo County, August 2012
[10] Result of income expenditure worksheets conducted with FFS groups, Morobo County, August 2012
[11] 1 USD = 2.97 SSP, http://www.convertworld.com/de/wahrung (accessed: 25/07/12)

Table 6: Exemplary profit margin calculations in SSP per feddan (Own calculation[12])

	Cassava	Maize	Sorghum	Groundnuts	Beans	Tomatoes
Total revenue	3600	1267	1000	1050	4200	24545
Total variable costs	2230	957	1575	1570	1780	5845
Profit margin	1370	310	-575	-520	2420	18700
Total fix costs	270	173	260	320	200	840
Profit margin II	**1100**	**137**	**-835**	**-840**	**2220**	**17860**

Revenue – Variable costs = Profit margin – Fix costs = Profit margin II

The highest costs are always attributable to labour. They vary from 50 to 75%. Two other factors that greatly influence the profit margins are the market price and the amount of harvest per feddan. In general, most crops yield high prices on the markets, but agricultural productivity and the amount of harvest per feddan is low. Nevertheless, the calculation of profit margins also shows that some crops have only generated a minor profit or even a clear loss. This is the case for maize, groundnuts and sorghum. Possible reasons are low market prices and unfavourable weather conditions. AAO particularly highlights technical reasons, such as the bad quality of seeds and poor agricultural practices, especially poorly-timed activities such as planting, weeding and harvesting.

Dry Season Activities

For most farmers, December to March constitutes a distinct dry season in the year (see Figure 14). Only farmers who have access to permanent water sources can make use of a third growing season during this time. Permanent water sources include rivers, streams, swamps, and steep valley depressions, which collect water during the rainy seasons. Only 5% of farmers in Morobo County however, are estimated to have access to such sites[13].

Figure 7 indicates that food harvested in November/December needs to be stored for six to seven months, until July, when the next harvest is due. As few farmers are capable of doing so, local prices for food increase towards July. Food prices for grains start to increase around April/May and peak in around June/July, the hunger season of the year, when food demand finally outstrips local supply (For more detail, please see chapter 0). Fruit and vegetables are in high demand right from December, since these crops cannot be easily stored. With 6 out of 13 FFS sites having access to a

[12] Expert interview with AAO, Morobo County, 23/10/12

[13] Expert interviews with AAO, Keliko Farmers Association, and GIZ DETA agricultural advisors, Morobo County, August 2012

permanent water source[14], GIZ DETA's FFS approach in Morobo County has high potential for dry season vegetable production. This could be used to increase local food security by increasing farmers' income and local food availability.

Livestock Farming

Less than 5% of farmers in Morobo County have specialised in livestock farming. 95% of farmers practice arable farming (Börgel 2009). They keep livestock only as collateral. Goats and poultry are commonly found on these types of farms, although pigs, donkeys and cattle can also be found. Among farmers of Morobo County it is relatively common to fix large sums of money in the form of cattle.

Farm Sizes

Access to land is not a limiting factor. Nearly all farmers have unlimited access to land. Communal land rights allow for the expansion of individual farmers' plots as long as the elders (the chiefs) of the clan are convinced that the respective farming household is able to cultivate the additional acreage being demanded. Informal land tenure agreements are also possible between neighbours. For example, a farmer who wishes to cultivate additional land may be offered to cultivate his neighbour's unused land in return for giving him/her a share of the harvest.

Cultivation Capacities

A recent baseline report on 30 farmer groups (comprising 512 individuals) conducted by GIZ DETA concluded that the average small-scale farmer in Morobo County cultivates a plot size of 2 to 3 feddan which is 0.8 to 1.2 ha (GIZ 2012). This is consistent with the results obtained from this study. Nevertheless, it is important to point out that GIZ DETA in Morobo County covers small-scale farmers with different cultivation capacities. Out of 20 interviewed farmers, 5 have only been able to cultivate up to 1 feddan (0.4 ha). 9 out of 20 farmers have been able to cultivate 1 to 3 feddan (0.4 to 1.2 ha), whereas only 6 out of 20 farmers have been able to cultivate 3 to 6 feddan (1.2 to 2.4 ha). No farming households have been able to cultivate more than 6 feddan, which is equivalent to 2.4 ha (see frequency distribution in Annex 17).

Table 7 summarises the cultivation capacities of farmers in Morobo County and the associated limitations.

[14] Expert interviews with AAO, Keliko Farmers Association, and GIZ DETA agricultural advisors, Morobo County, August 2012

Table 7: Cultivation capacities of farmers and associated limitations

Cultivation Capacity	up to 1 feddan: 25% of farmers	1-3 feddan: 45% of farmers	3-6 feddan: 30% of farmers
Food Security	Precarious situation	1 to 2.5 feddan needed to feed the family	Surplus production possible
Hiring a Tractor	Financial capacity of farmers is insufficient	Financial capacity of farmers is insufficient	Few farmers can afford to pay for it
Recruitment of Farm Labourers	Financial capacity of farmers is insufficient to pay for external labourers	Financial capacity of farmers is insufficient to pay for external labourers	Most farmers make use of communal farming arrangements

Achieving household food security requires a cultivation capacity of 1.5 to 2.5 feddan (0.6 to 1.0 ha): Based on current farm practices, tools, family size, and feasible yields, farmers need to cultivate 1.5 to 2.5 feddan (0.6 to 1 ha) to satisfy household food requirements. If additional land is being cultivated, it is destined for market-oriented crop production. Since most farmers in Morobo County cultivate plot sizes of 2-3 feddan, or 0.8 to 1.2 ha (GIZ 2012i), the food that they produce from the land is just enough for family requirements (subsistence needs). Very little of the produce is destined for sale.

Low degree of mechanisation limits farmers' cultivation capacity: Most farmers cultivate a maximum of 2 to 3 feddan (0.8 to 1.2 ha) because of limited availability of farm labour or a low degree of mechanisation. Most farmers in Morobo County are restricted to hand hoes. There is no customary animal draught system. Most families cannot afford to hire a tractor. The low degree of mechanisation has been repeatedly mentioned as a major limitation to expanding cultivated area for cash crop production.

Means of overcoming labour bottlenecks: Three options exist whereby farmers are able to cultivate more than 3 feddan (> 1.2 ha): hiring a tractor, paying for farm labourers from Uganda, or making use of communal farm labouring arrangements[15]. Communal farm labouring was mentioned as the strategy of choice to overcome labour bottlenecks. Communal farm labouring works by recruiting friends and neighbours from within the community. Teams consist of up to 6 farmers who deliberately plan their actions. Members barter farm labour amongst one another by working each other's fields in rotation. The rule is that on one day, one farm is worked. The next

[15] Some farmers in Morobo are able to cultivate 3 to 6 feddan (1.2 to 2.4 ha).

day the team rotates to another member's farm. The maximum area that is to be cultivated by each person is one "katala" (4m x 50m) per day. During labour peaks, such as the time of land opening, ploughing, or weeding, this ensures that each member benefits equally from the team arrangement. Communal farm labouring has the advantage that there are no financial costs involved. Friends and neighbours can be remunerated with food and drinks. The limitation of the system is that social capital and a positive group dynamic influence successful implementation. Extension officers have remarked that during labour peaks it can be difficult to secure support from friends since everybody is busy tending his/her own field. The difference to paying labourers is that the reliability of voluntary workers turning up is typically weak. Paid labourers accomplish the job more efficiently. Farmers in Morobo County do not hire tractors or farm labourers from Uganda due to insufficient financial capital[16].

Market Access

Table 8 summarises market access constraints of farmers with different cultivation capacities in Morobo County.

Table 8: Cultivation capacities of farmers and market access constraints

Cultivation Capacity	**Up to 1 feddan: 25% of farmers**	**1-3 feddan: 45% of farmers**	**3-6 feddan: 30% of farmers**
Market Access	Farmers do not sell much of their produce	Farmers only sell on local markets	If the harvest is good farmers can sell to far reaching markets. Most farmers only sell on local markets.
Use of Bulk Storage		Farmers rent stores on demand at local market places	Typically farmers in cooperatives and producer associations
Organisation of Transport			Typically farmers in cooperatives and producer associations

Market access is determined by road infrastructure: Prices for farm produce are linked to the condition of road infrastructure: Producer prices decrease with inaccessibility. This is because transport becomes more costly the more difficult it is to access a location. To give an example: If a crop is sold at 40 SSP in Yei (a regional

[16] Hiring a farm worker costs 20 SSP per katala for land opening (clearing the land of vegetation), or 15 SSP per katala for ploughing land that has already been opened.

trading centre), the same crop is sold at only 10-15 SSP at Yaribe local market.[17] The connection to markets and traders is a big problem in Morobo County as roads are in bad condition (World Bank 2012).

Market access is determined by storage capacity: The ability to store bulk quantities of food at easily accessible, central, road-connected locations acts as an attraction point for transport service men and wholesale buyers. Improved bulk storage facilities at community level are concrete buildings with corrugated iron roofing (see Figure 15).

Figure 15: Improved bulk storage facility along Morobo-Yei road[18]

In Morobo County only those farmers who are organised in producer associations, such as Keliko or Nyongale Association, regularly use improved group storage facilities. The association owns the store and members only have to pay a low rent to use it. In contrast, farmers who cultivate less than 3 feddan tend not to be part of producer associations. Consequently, they do not regularly use group storage facilities. They only use traditional granaries or store their products inside their houses. Sometimes these farmers form groups, within existing FFS groups for example, and rent a store at nearby market places. This happens on demand for marketing their products.

Market access is determined by access to affordable transportation: For the far-reaching markets, transport vehicles need to be hired. Only large producer associations such as Keliko Farmers Association own trucks for collective use. If a farmer group possesses its own means of transport, transportation costs drop considerably:

[17] Focus group discussion with Yaribe FFS group, Morobo County, 24/08/12

[18] Own production

transport costs can be cut by about half - from 100 SSP / sack / 3 km to about 50 SSP / sack / 3 km, as in the case of Keliko.

Farmers who do not form part of a producer association but manage to cultivate between 3 to 6 feddan do sometimes organise their own transport too. But this only happens when they have a good harvest. When farmers' yields are high or when farmers harvest large quantities of good quality products, they ask friends in nearby market places for market information. When prices are good, they travel to the local or domestic trading hubs (e.g. to Yei or Juba) and arrange their own transport with transport service companies on the spot.

Market access is determined by the recruitment of affordable farm labourers: Market-oriented farming requires sufficient cultivation capacity during labour peaks of ploughing, weeding, and (post) harvesting. Farm labourers are not however readily available in South Sudan. South Sudanese workers tend to be more expensive than workers from Uganda. This is linked to the following historical and social reasons:

- Manual labour is not well respected in South Sudan. This is linked to hopes and new perspectives, which resulted from national independence in 2011. Over the past 50 years of Arab domination and racial discrimination, the South Sudanese were limited to manual labour. Today nearly every family, no matter how poor, sends their children to school in the hope that the next generation will have better prospects of attaining white-collar jobs[19].
- Living expenses are higher in South Sudan than in neighbouring Uganda. This is linked to the petrol-dollar inflated SSP. As a result, South Sudanese manual workers are uncompetitive with the workforce from Uganda, since the South Sudanese need higher wages in order to cover their living costs.

Farmers' Knowledge

At the moment, knowledge and skills on sustainable agriculture are lacking among farmers, as is as an awareness of the long-term benefits of a sustainable agriculture approach. A general problem is the low degree of intensification of crops. According to expert opinion, an estimated 60% to 90% (i.e. the vast majority) of local farmers practice extensive agriculture. They use little to no input and practice shifting cultivation. Shifting their fields happens within communal clan land arrangements but also with infractions into public land, where natural resources are destroyed. 90% of farmers are estimated to burn, while only 10% slash-and-burn, when clearing vegetation. Only a few farmers incorporate residues and other biomass when preparing their fields for cultivation.

[19] Expert workshop with FFS facilitators, Morobo County, 05/09/12

An overview of sustainable agricultural practices in use in Morobo County is summarised in Table 9 which highlights possible entry points for further training. More detailed information on this table can be found in Annex 15.

Table 9: Knowledge about sustainable agriculture among farmers in Morobo County[20]

Sustainable Agricultural Practice	Existing knowledge among farmers in Morobo County
Intercropping	Traditionally practised
Rotational Cropping	The majority of farmers rotate their crops. Following sequence is common: Cereal => Legume => Vegetable
Green Manuring	Not practised / not yet introduced. But some farmers leave their fields to rest for two years before re-cultivation. This activity is planned for the second season of 2012
Use of Animal Manure	Only used in vegetable production, not in cereal production
Rotational Grazing	Not practised / not yet introduced. But some farmers own cattle that graze extensively on public land.
Use of Fertiliser	Little to no knowledge available among local farmers on how to use fertilisers in a resource-sensitive manner.
Agroforestry	Experience in the use of wood fuel and timber trees is available. A few farmers plant fruit trees. Hardly any farmers plant fodder shrubs or fertiliser trees.
Conservation Tillage	Not practised / not yet introduced
Integrated Pest Management	Not practised / not yet introduced
Appropriate Irrigation Technologies	Around 1/3 of farmers have access to wetland sites and use watering cans to irrigate dry season vegetables.
Crop Diversification	> 2/3 of farmers practise diversified cropping; < 1/3 of farmers have a higher degree of specialisation
Seed Saving of Open Pollinated Varieties	Virtually all farmers use open-pollinated varieties (OPVs), which they can save for the next season. Seed saving by local farmers has room for improvement.

Legend

	easy to elaborate since most farmers already practise it
	possible to elaborate as some farmers have an initial experience
	difficult to teach as farmers are not familiar with the technique

[20] Expert interviews with AAO, Keliko Farmers Association, and agricultural advisors of GIZ DETA, Morobo County, August 2012

4.1.3 Livelihood Systems

Southern Sudan has an average household size of 6.3 people of which about 52% are females. In terms of **financial assets**, the estimated annual average household income is 2,381.51 SSP (801.85USD) while the estimated annual average household expenditure is 2,170.12 SSP (730.68USD). A household saves around 211.38 SSP (71.17USD)[21] annually which might not be enough to cover expenses during the food gap months in June, July and August, as wells as travel and other types of expenditure (World Bank 2012).

The results of the **Income Expenditure Matrix** conducted in four FFS-groups show that farmers only earn around one fifth to one sixth of their total income from non-farm work. Among the most important **non-farm income** are working on other farms and charcoal burning, which was mentioned by all four groups. Bricklaying, teaching and cutting grass for sale was mentioned by two groups in descending order of importance. The other less important sources of income that were mentioned by two groups were selling poles from the woods, hunting wild animals, brewing local alcohol and bricklaying. The most important **on-farm income** was generated from planting beans, groundnuts, maize, cassava and selling animals. Some groups had individual high price crops like rice and coffee in Renu FFS, honey and rice in Kendila FFS, timber, Irish potatoes, fish and sesame in Iraga FFS.

Main types of expenditure include school fees and healthcare followed by clothing, household items, animals and the construction of houses. In some groups, transport, marriage and funeral were also named as a main type of expenditure.

A cursory **assessment of literacy** showed that only a few people can read or write. E.g. in Khor Kindi, 4 out of 20 members could read and write in English. In Aloto, no one could read or write, the chairman got help from a teacher. In Yaribe, almost all men could read and write in their local language; people with positions knew how to write in English.

Most farmers send their children to **primary school**. Children who are enrolled in primary school have to work on the farm during weekends. After primary school, most of the children from farmers' families have to work on the field full-time. One reason might by the high school fees for secondary school. Primary schools charge 35-70 SSP per term, depending on the school. Secondary schools cost 200-350 SSP per term. There are three terms per year and the fees have to be paid at the end of February, May and September each year.

[21] 1 USD = 2.97 SSP, http://www.convertworld.com/de/wahrung (accessed: 25/07/12)

Vulnerability Context

June, July and August have been reported as the worst months in terms of **food security**. However even in the lean period, families normally have one meal per day. It was only the FFS group in Bakoubiki that did not have any problems with food security throughout the whole year[22]. In agricultural terms, January and February are the worst months as there is "not a drop of water, tilling becomes very hard"[23]. The most dangerous diseases are Malaria and Typhoid.

As a potential **natural risk**, the farmer groups named "heavy rain" sometimes "in March"[24] but also "in November"[25]. The greatest danger mentioned for the farmers' crops was the "late arrival of seeds in combination with early rain, especially when planting beans"[26]. None of the interviewed groups felt insecure about working in agriculture. Furthermore, animals destroying crops were a problem in every group, especially during dry spells when everybody lets the animals move around freely. Although there are mechanisms to resolve conflicts, there is no specific law that give farmers the right for compensation.

Nearly every group interviewed has **abundant land** to carry out agriculture, except for one group from Kendila, which stated that "we just have what our grandfathers left us"[27]. There were no reported cases of foreign investors buying land. Additionally, no major problems with land ownership were mentioned although one woman stated that there have been "field border conflicts with neighbours"[28].

The question whether the group's participation in FFS started or encouraged any conflicts was denied by all asked groups. The Kenza group that dropped out did however report that the group's participation in the FFS project has been prevented by the Boma chief[29].

HIV/AIDS

HIV/AIDS is an important cross-cutting issue given that economic and social progress is held back by the disease. It is also relevant for GIZ DETA in South Sudan as affected farmers need to be treated, meaning that their working hours are cut and therefore the economic output of the affected family is less efficient. Taking care of

[22] Focus group discussion with the Bakoubiki FFS group, Morobo County, 17/08/12

[23] Focus group discussion with the Karua FFS group, Morobo County, 10/08/12

[24] Focus group discussion with the Karua FFS group, Morobo County, 10/08/12

[25] Focus group discussion with the Kendila FFS group, Morobo County, 17/08/12

[26] Focus group discussion with Karua FFS group, Sobeta FFS group, and Bakoubiki FFS group, Morobo County, 10/08/12, 14/08/12, 17/08/12

[27] Focus group discussion with the Kendila FFS group, Morobo County, 17/08/12

[28] Focus group discussion with the Karua FFS group, Morobo County, 10/08/12

[29] Focus group discussion with the Kenza 'dropped out' group, Morobo County, 27/08/12

an infected member is a heavy burden that hampers the economic and social development of the whole family.

> *"The Southern Sudan AIDS Commission and the Ministry of Health estimate the region's HIV prevalence to have been 3.1% among adults at the end of 2007. Small-scale surveys indicate that rates vary from as high as 10% in areas bordering Uganda to less than 1% in more central parts. Populations most at risk of HIV infection include refugees, internally displaced people, soldiers, truckers, sex workers and tea sellers, as well as women and young girls more generally."* (Alliance Sudan 2010: p.1)

Morobo County, with its important border point with Kaya can therefore be classified as a high-risk region. HIV-related project activities in the past have been supported by various organisations (e.g. Malteser International, Family Health International, Alliance, the Global Fund). The Morobo County Health Department is working on the topic through awareness-raising and voluntary testing.

Four voluntary HIV testing centres were set up in 2009: two in Kaya, one in Morobo and one in Alotto. The data collected shows a very variable prevalence, ranging from 1.3 to 10.3%. Due to the limited database, no representative conclusions can be made. However the number of people who have gone for testing has increased in 2011, which may be due to increasing awareness.

In line with BMZ and GIZ general policy (BMZ 2012, GIZ 2012h), capacity development for HIV/AIDS awareness and mainstreaming within DETA and DETA-supported activities is an envisaged outcome of DETA component 4. However the development of a strategy to incorporate the topic of HIV/AIDS in GIZ DETA activities is still in progress.

4.1.4 Description of the GIZ DETA FFS Intervention

GIZ DETA has chosen the FFS approach to support small-scale farmers in Morobo County to act as a link between emergency and development aid. It is part of the project component 2, which aims at improving the income and food security of rural households in Morobo County through the promotion of agricultural and non-agricultural activities. Since 2008, GIZ DETA has been distributing seeds and hand tools to 40 farmer groups in Morobo County as a relief-based intervention. To supplement this with training and to go into long term development the project started a pilot-phase with 13 FFS in March 2012 to increase agricultural productivity. This is leading to a move towards technical development cooperation within the LRRD framework.

The FFS approach is a channel for distributing necessary inputs as well as increasing farmers' agricultural knowledge and their organisational capacity. Smallholder farming systems are complex, diverse and risk-prone. FFS provide locally generated innovations, create knowledge for action and boost local management and leader-

ship skills. Services delivered in FFS are crucial since government services, social and productive infrastructure was dilapidated in South Sudan during the civil war. Many of the facilities to safeguard livelihoods are now missing since refugees returned to their homesteads in South Sudan.

Structure and Organisation of the FFS Intervention

Figure 16 shows the structure of the FFS approach and linkages to the GIZ DETA project management, the local partner government and the master trainer. The project management consists of a union leader and an agricultural advisor. In addition there is a project coordinator and the head of the agricultural unit, supported by three agricultural supervisors.

The initial concept for the implementation of FFS was developed jointly by GIZ DETA and CAD. For the actual design and implementation, GIZ DETA and the Agricultural Advisory Organization (AAO) are taking the reins. They are in charge of the overall setup as well as the content and methods of the **Training of Trainers (ToT**) i.e. the training of the facilitators and the arrangement of FFS activities. AAO is specifically responsible for developing and conducting the ToTfor the facilitators.

The **facilitators** are in charge of training and facilitating the farmers during the FFS activities on the demonstration plot and to carry out a follow up on the individual farmers' fields and adapted farm measures. In the FFS, field facilitators are backed by agricultural advisors from GIZ DETA and AAO staff[30]. Upon the request of the CAD facilitators are Boma Extension Workers (BEW), who are agricultural extension workers at the village level. They are employed by the CAD but do not receive any salary, only basic training at the Crop Training Center (CTC) in Yei. GIZ DETA selected eight male BEW whom they pay a small monthly incentive and supply with bicycles and other material.

Most of the 13 **FFS** consist of two to three groups, making a total of 26. Of the 452 members, 166 are women. As of September 2012, no individual member has dropped out, but one entire FFS, namely Kanza has done so. This was due to disunity and miscommunication between the farmer group and the local chief[31].

Most of the farmer groups were formed in 2009/2010 and have received input from GIZ DETA since then. Only a few farmer groups were founded earlier (the Aloto farmer group in 2007) or very recently (the Iraga and Khor-Kindi farmer group in 2012). In general, groups can apply for support from GIZ DETA by contacting their BEW. He forwards the request to the CAD via the Payam office. Finally the CAD

[30] Expert interview with AAO, Morobo County, 20/08/12

[31] Focus group discussion with the Kenza 'dropped out' group, Morobo County, 27/08/12

passes on the request to GIZ DETA. Some groups have also received support from the CAD and other donor organisations.

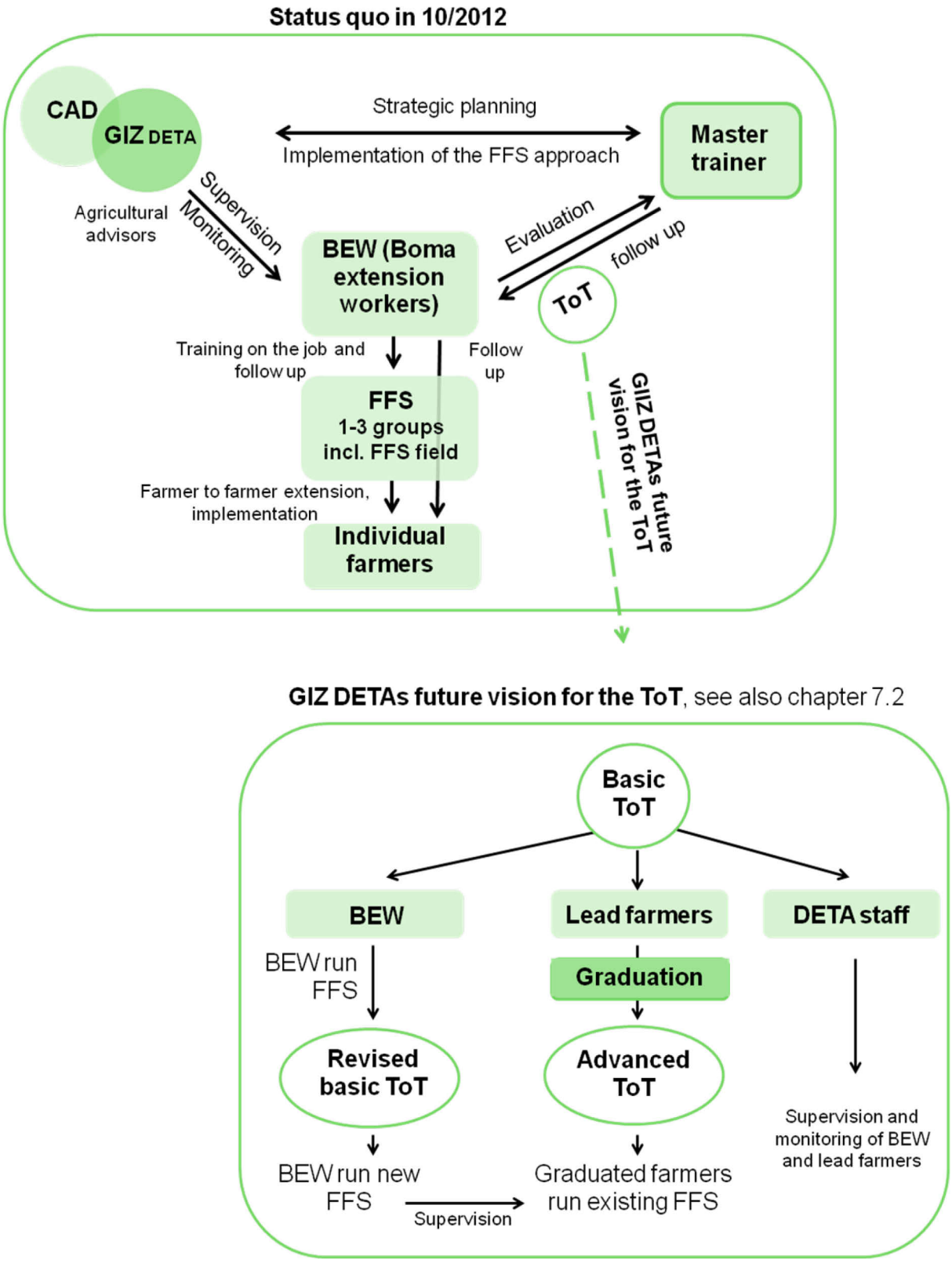

Figure 16: Organisation of the FFS intervention (Own figure)

Example: Previous support

Karua FFS group:

"The CAD referred us to the Danish NGO called Danish Refugee Council with the help of which we decided to engage in Agroforestry and established a nursery (eucalyptus, teak and banana). The seeds for the nursery were provided by the CAD and the Danish Refugee Council, which also organised training sessions"[32].

Ground working Activities and Training FFS Groups

Ground working activities need to be carried out before implementing a FFS and this includes identifying priority problems and selecting FFS sites (see chapter 3.1).

- **Needs assessment**

Prior to the implementation of the FFS approach, a needs assessment was carried out for all 40 farmer groups which had been previously supported by GIZ DETA. The assessment took into account two main specifics. **Which and how many groups** are suitable to start as FFS and **which crops should be promoted**.

The assessment looked into the following group aspects:

- Agricultural performance
- Commitment to carry out agriculture
- Motivation for participation
- Group structure
- Gender balance
- Group size (ideally 20-25)
- Support by other organisations
- Issues of nepotism

26 groups were selected to guarantee proper handling and management by means of high quality training and follow-up activities[33].

To ascertain **which crops to promote**, farmers' knowledge and preferred seeds and crops were identified. Based on this, GIZ DETA and AAO suggested a list to the CAD who then made the final decision, aimed at strengthening national staple food production. As a result, GIZ DETA distributed vegetative plant material for cassava, sweet potato, pineapple and banana and imported seeds for maize, beans, groundnuts and sorghum. In the second FFS season, green manure, namely lablab, wild sunflower and dismodium will be introduced[34].

To establish the **content of the FFS training** i.e. the modules taught within the ToT and on the FFS field, GIZ DETA carried out a brief baseline study. Based on this, GIZ DETA and AAO developed the ToT content upon which the CAD agreed on.

[32] Focus group discussion with the Karua FFS group, Morobo County, 10/08/12

[33] Expert interview with GIZ DETA staff, Morobo County, 18/08/12

[34] Expert interview with GIZ DETA staff, Morobo County, 18/08/12 and AAO, 20/08/12

- **Planning workshop**

GIZ DETA conducted a planning workshop with important stakeholders, such as the CAD, head men of the community[35], lead farmers and others. During the workshop **suitable locations** for FFS fields were selected based on criteria such as distance to community centres and roads. This shall guarantee both accessibility and visibility to raise awareness of non-FFS-participants. Participants agreed on the size of the demonstration plot of approximately one feddan. Furthermore critical issues, such as the provision of land for the FFS fields and the selection of beneficiaries were discussed and agreed on.

Example: Prevention of conflicts

Prior to the workshop the land issue was unclear to some head men. Some thought the land provided for the demonstration plot would be rented out to GIZ DETA for their profit. It was clarified that the land is still available to everyone in the community and is being used for the benefit of the community and not for GIZ DETA. As a result, the level of support from head men is now generally high.

- **Training on group dynamics**

Prior to starting the first FFS activities, GIZ DETA trained the selected farmer groups in group dynamics for two days. The purpose of the training was to:

- Enable farmers to understand the importance of working together as groups;
- Enable groups to develop group norms and a constitution;
- Ensure that group members and leaders know their roles and responsibilities; and
- Enable farmers to develop a group work plan and monitoring and evaluation activities.

Group Structure, Timeframe and Documentation

As soon as groups are formed they select a management committee. Those committees generally consist of a chairperson, a secretary and a treasurer – all with vice positions – and in some cases, an agricultural advisor. In general women are part of the committee, sometimes as the treasurer, and in one case also as chairlady. However women mostly hold vice positions. Besides the formal positions, the study team observed that most FFS group have one or more strong members (mostly members of the committee or knowledgeable farmers), who may take over the role of a lead farmer. They can act as a driver for the group and maintain the social cohesion. Furthermore some groups have a constitution or statute with detailed rules.

[35] Community leaders that are controlled / supervised by Boma chiefs

Example: Management committee

In the Reno FFS the members selected the committee when the group was set up. As long as the group is satisfied with the committee there is no need for elections.[36]

Examples: Constitution

Lujulo East FFS group: "No absence allowed. Being punctual. No corruption. Obedience."[37]

Iraga FFS group: "There are no group rules besides having to pay 25 SSP per month and having to be committed."[38]

Yaribe FFS group: "If somebody is missing for a long time, they have to ask, if he has no interest they discharge him from the group; after 5-6 times."[39]

In general FFS have scheduled activities one day per week on the FFS field, e.g. from 9 am to 2 pm. If a FFS consists of more than one group, each group also has an individual group plot apart from the FFS field, on which they work together on another day of the week.

When visiting the groups the study team did not observe any **practical documentation** of field lessons. However, according to the groups some records are usually kept by the secretary. However, it does not seem that these records are targeted at members who cannot read and write, to be used in the learning process of the group. The secretary is often the only one in the group who can read and write in English.

Example: Documentation

Yaribe FFS group: "The Secretary has all the documents; records on what they have been taught. After learning they go home and they put it on paper. Some cannot write, they keep it in their head."[40]

Content and Methods

The following ten ToT modules comprise the main content of the FFS training during the first season:

[36] Focus group discussion with the Reno FFS group, Morobo County, 14/08/12
[37] Focus group discussion with the Lujulu East FFS group, Morobo County, 21/08/12
[38] Focus group discussion with the Iraga FFS group, Morobo County, 21/08/12
[39] Focus group discussion with the Yaribe FFS group, Morobo County, 24/08/12
[40] Focus group discussion with the Yaribe FFS group, Morobo County, 24/08/12

1. Famer field school approach
2. FFS setting and establishment
3. Planting of selected main field crops
4. Weed management practices in crop field
5. Pest and diseases management
6. Seed and seed multiplication
7. Post harvesting management of crop
8. Soil and water conservation practices
9. Environmental management
10. Farmer field school result and data analysis

Figure 17: Overview of the ToT modules

- **Design and implementation of training**

One training module is being taught over the course of one day and consists of a theoretical part, a practical part and an evaluation. Until September 2012 the first eight modules have been taught to facilitators. Training material consists of flipcharts and power point print outs. The focus of the training is practical topics such as planting, weeding and pest and disease management, which are taught on the master trainers' demonstration farm. After theToT, the facilitators and farmers implement what they have learned on the FFS fields and the individual farmers' plots. The master trainer supports the facilitators with a follow-up in the field. He discusses any problems that arise and gives advice accordingly. GIZ DETA's FFS approach distinguishes between three field levels as shown in Figure 18**Fehler! Verweisquelle konnte nicht gefunden werden.**.

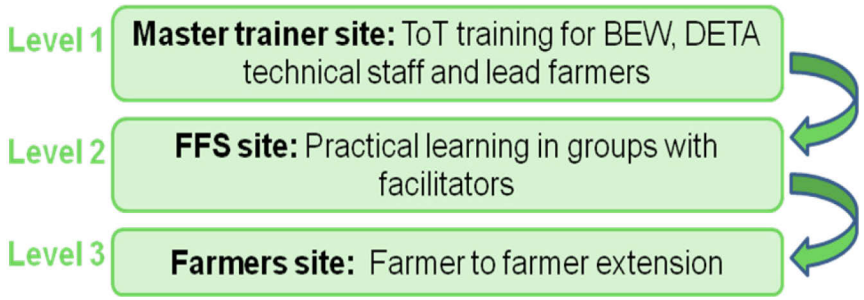

Figure 18: Field levels of the FFS approach (own figure)

Monitoring and Evaluation of the Implementation of FFS

The **ToT modules** are evaluated directly after they are carried out. Topics covered are the facilitators' level of understanding of the content and their satisfaction with the training. More detailed information is obtained through the analysis of **five documentation sheets**, which are filled out by facilitators throughout the FFS-season. They cover topics such as diseases and pests, plot record (planting date, germination date & rate and harvest) and attendance. According to AAO, the facilitators also interview farmers, group leaders and local chiefs, conduct field observations and look into the FFS' performance after theToT.

For the approach as a whole, GIZ DETA is currently developing an **M+E system**. The system will evaluate the implementation rate of improved agricultural practices on the FFS and individual plots and the challenges that arose. As a first step within the M+E system, a **crop yield assessment** is conducted by GIZ DETA. It gives an indication of the performance of each FFS and its members. Based on this, AAO will decide which farmers or FFS groups will graduate. The idea is to provide further training to disadvantaged groups and lessen supervision for more able groups.

Table 10: Services and service providers

Service	Stakeholder	Potential involvement
Coordination	GIZ DETA (coordination and organisation); CAD (counterpart for GIZ DETA component 2)	MoA
Content	GIZ DETA (needs assessment + decision); AAO (decision and development in detail); CAD (informed)	Facilitators; lead farmers; FFS groups
Training of master trainer	Not yet established; AAO (in contact with Juba University and update via internet)	
ToT	GIZ DETA (financing); AAO (implementation); CTC Yei (training of BEW); GIZ FSAD (training on “farming as a business”)	
Facilitators	BEW (appointed by CAD); lead farmers (if facilitators not present)	Lead farmers
Follow up	GIZ DETA (first steps); AAO (backstopping of FFS / facilitators)	
Inputs	GIZ DETA (tools and seeds); CAD (seeds in agreement with CAD); FFS groups (some purchase and seed saving); FAO (official seed multiplication / seed provision)	
Storage	GIZ DETA (warehouses in cooperation with WFP’s Purchase for Progress (P4P) initiative); FFS groups (mostly individual storage, hiring of group storage); Keliko, Nyongale	
Markets	Local markets; Morobo; Yei; Juba	
Transport	Transport middlemen	
Processing	Grinding mills in markets; Keliko, Nyongale	
Access to loans	FFS groups (saving groups); Equity Bank (for registered groups)	
Stakeholder exchange	Facilitators (exchange during training sessions); GIZ FSAD (platform for own stakeholders)	CAD (donor coordination); FFS groups

Necessary Services for the Successful Implementation of FFS

To successfully implement FFS in Morobo County, adequate project structures are a prerequisite. Beyond that, FFS and farmers also depend on other services and ex-

ternal infrastructure, e.g. markets where they can sell their produce. Services, service providers and potential future service providers are listed in Table 10.

4.2 Summary of Morobo County

Based on FAO (Kisha 2004), success factors and different secondary sources on experiences with FFS, the study team developed a set of assessment criteria as outlined in chapter 3. The analysis of the collected data was carried out accordingly and is directly linked to the description and findings in the situation analysis. The SWOT analysis looks into strengths, weaknesses, opportunities and threats of the three assessment criteria and presents initial impacts.

The following Table 11 gives a quick overview. The respective assessment criteria will be explained in more detail afterwards.

Table 11: Summary of SWOT (Details will be explained in the following subchapters)

Long-term success of the FFS-approach	Appropriateness of Content and Methods	Ground working activities	
• Existing structure of farmer groups that can be built on • Generally high motivation of farmer groups • Support by local authorities • Adequate resources and logistical support by GIZ DETA	• Training covers fundamental topics • Practical approach suitable for adult learning • Great appreciation of ToT run by AAO • Topics based on SA principles	• Good needs assessment and planning workshop	**Strengths**
• No long-term strategy yet • Lack of knowledge on how to fulfil responsibilities of positions in the group • Little motivation of farmers • CAD has no clear policy for improvement of small-scale farmers' livelihood yet • Monitoring and evaluation of the FFS season is not done by GIZ DETA	• Some content is missing, e.g. basics of agri-business and IPM • No appropriate extension material • Extension methods too unilateral. Not all potential methods are used • Level of participation is rather low, e.g. no use of PTD yet • ToT is too short considering needs and abilities of facilitators and farmers • Empowerment of women is still a challenge	• Selection of facilitators is inflexible • Limited training on group dynamics • Late start of FFS activities	**Weaknesses**
• Sustainable agriculture needs a longer term perspective • Resources are lacking with GOSS and CAD • Limited resources of AAO • Motivation of youth is low	• No functioning local seed system is in place • Capacity limits of farmers and AAO • Accessibility cannot be assured in very remote areas	• Limited planning horizon due to LRRD • Facilitators might leave the project	**Threats**
• GIZ FSAD works on agricultural value chains in the region • Based on pre-existing group structures	• High potential area that allows cultivation of a wide range of crops	• Further inclusion of the CAD • Availability of natural resources and high potential for increase of agricultural productivity	**Opportunities**

4.2.1 Ground working Activities

Strengths

In general, the ground working activities to prepare for the FFS were done well and many important stakeholders were included.

- **Needs assessment:** The main necessary steps were carried out in an appropriate way. The selection of sites, groups and crops as well as the decision on the content was made using appropriate methods and criteria. Important stakeholders made decisions jointly based on the needs and abilities of farmers.
- **Planning workshop:** GIZ DETA conducted a planning workshop with all the important stakeholders to (a) present the approach, (b) select sites in a participatory way, (c) ensure that all stakeholders have the same understanding, and (d) avoid ambiguities or conflicts.
- **Choice of facilitators:** The approach concentrates on BEW, instead of Payam Extension Workers (PEW). BEW are better rooted in the communities as they often come from the communities themselves. This strengthens local structures and relieves the Payam level, which many other aid organisations use as an entry point for their agricultural capacity building.

Weaknesses

- **Formation of groups:** It seems like some groups were formed solely to receive agro-inputs with no other clear goals or objectives (GIZ, 2012a).
- **Selection of facilitators / BEW:** BEWs are part of the CAD. By decision of the CAD, GIZ DETA can only choose from existing BEW to become facilitators. Thus the quality of the FFS depends on the quality of the BEW whose capacities are rather low. Furthermore, there are no women amongst them, who could deal with other women more easily.
- **Group dynamics:** The duration of the training session on group dynamics is very limited hence some topics like monitoring and evaluation are not tackled properly (GIZ, 2012a).
- **Late start of FFS activities:** The start of the FFS activities and seed distribution was not timed well (GIZ 2012f). The challenge of the procurement procedures makes accurate timing difficult. This weakness is linked to the threat of a limited planning horizon. Furthermore, the quality of seeds in the case of maize and beans was below that expected. Kendila and Lujulu East farmer groups mentioned this problem.

Opportunities

- **County Agricultural Department (CAD):** The inclusion of CAD and its Boma Extension Workers (BEW) is seen as an opportunity. The inclusion and support of FFS by the CAD guarantees long-term existence.
- **Natural resources and high potential:** The project is backed by the endowment of sufficient natural resources. Ample land is available to establish new FFS fields and expand existing agricultural area. Also in terms of rainfall and fertile soil, resources are available on a large scale at the moment, which is also the case for off-season production. The potential for farmers to enhance the production and productivity of their farms to improve the resilience of farming households is still high.

Threats

- **Limited time horizon:** With the one-year LRRD funding cycles, the project has a limited time horizon, which makes long-term planning almost impossible. This leads to limited strategic planning and is related to the weakness of late procurement.
- **Selection of BEW:** GIZ DETA depends on a limited number of qualified BEW. This causes a bottleneck when scaling up the project.
- **BEW might leave the project:** There is a risk that BEW who acquire a good level of knowledge and skills may be poached by other organisations with better salaries or career possibilities.

4.2.2 Appropriateness of Content and Methods

Strengths

Great appreciation of ToT run by AAO.

- **Content:** Up to now, fundamental topics are taught to the farmers. They are generally based on the needs and abilities of farmers and facilitators.
- **Practical approach:** One of the approach's considerable strengths is its highly practical orientation, both at the ToT level and the FFS field level. Direct implementation of topics in the field motivates facilitators and farmers and constitutes an adequate learning approach for adults.
- **Master trainer:** The facilitators are very appreciative of how AAO runs theToT The study team assessed AAO to be a good master training institution based on the good demonstration farm and the well-educated and highly motivated staff.
- **Sustainable Agriculture:** In general, the topics taught in the FFS as a whole are appropriate first steps towards promoting sustainable agriculture. By including

topics like crop rotation, green manure, animal manure, crop diversification, seed savings and by concentrating on a low external input strategy, this will be fortified in the future. For more details see the discussion in chapter 7.1.

Weaknesses

- **Missing content:** Some content has not been adequately appreciated by farmers yet. For instance, vegetable seeds were distributed because of their high market potential, but the distribution was not yet part of a package including training in the first season. Furthermore, basics of agribusiness, ecologically sound production techniques (e.g. agroforestry), IPM, support of soft mechanisation, as well as responsibilities of group positions, have not been yet formed part of training modules. The issue of post-harvest handling is a topic in theToT, but farmers are still lacking skills in the proper drying, storage and marketing of products. Also the facilitators are not trained properly.
- **Extension material:** Extension materials for ToTand farmers are not produced systematically or are not available at all. Facilitators have problems reading and understanding available print-outs due to the small font size and lack of knowledge of the English language. Further extension material is not available. Apart from deficient learning conditions, it results in a lack of visibility and documentation.
- **Extension methods:** By using the current extension methods, the self-learning capacity of farmers is only promoted in a minor way. All the potential methods that attract a broader spectrum of clients and collaborators are not used. Furthermore, the external visibility and broad-scale effect in terms of diffusion of the FFS-approach to other farmers, traders and processors has not yet been achieved.
- **Farmer participation:** In the current design of the FFS, the level of participation of farmers is low. Although it fits to the specific situation and the low level of agricultural education, an increase of participation positively influences the motivation and ownership of farmers. Furthermore, the methods of PTD and agroecosystem analysis (AESA) are not yet used.
- **Design of theToT:** Considering the needs and abilities of facilitators, the length of a single ToT module was assessed to be too short. Facilitators and farmers have limited capacities and need more time to assimilate the content. In particular, the modules on pest and disease management and seed savings are difficult to understand. Also, each module is taught only once without a refresher session. Furthermore, the follow-up on the FFS field is insufficient.
- **Role of women:** The empowerment of women continues to be a challenge. With the exception of a few FFS, the majority of members is male and the majority of positions in the group are held by men. During the interviews it was mostly men

who answered. Active engagement in discussions and decision-making has been assessed to be low. This is also hampered by the illiteracy of the majority of women. As long as no appropriate extension material is available, illiteracy will hinder women from having access to information and become active beyond their traditional role.

- **Sustainable Agriculture:** The economic dimension of sustainable agriculture has not yet been looked at in detail. It is questionable whether a generated positive net return can be achieved in the long-term by only applying the content that is in place at present. The precondition is production increase, but also the link to markets and knowledge on post-harvest handling, marketing, and basics of agribusiness. This capacity is lacking amongst farmers and has not yet been extensively incorporated in the ToT and FFS sessions on the ground. When this is not guaranteed for the future, farmers will not be able to turn their production increase into an economic improvement.

Opportunities

- **High potential area in terms of agricultural production:** Very favourable natural resources allow for the cultivation of many different types of crops.

Threats

- **Seed system:** Good quality seeds that are appropriate for local conditions are lacking. Importing seeds from neighbouring countries often takes a long time and seeds do not fulfil quality requirements. A local seed multiplication system is still in process, to be established with the support of FAO in cooperation with AAO.
- **Limits to include topics:** Not every suitable topic can be included in the approach at once because there are limits to logistical resources from AAO and capacity limits from farmers.
- **Remote areas:** If very vulnerable farmers in remote areas are included in the approach, accessibility cannot be assured and services do not reach the farmers or only in a very inefficient way.
- **Resent amongst farmers:** Two groups have named the fear of envy and jealousy of non-group members.

Example: Envy

Sobeta FFS group: “people may burn our storage down in a bad mood or someone may steal it”[41]. The Aloto FFS group has named the same reason for having no storage facilities[42].

4.2.3 Long-Term Success

Strengths

- Long-term strategy: GIZ DETA is still in the process of developing a systematic long-term strategy. Some aspects that will be included are:
  - Concentration on lead farmers who can take over the role of the facilitator
  - Making use of the graduation process for lead farmers as part of an exit-strategy; Graduated lead farmers should be capable of continuing the facilitation work
  - Strengthening the commercialisation of agricultural activities by gradually linking farmers to markets, e.g. by improved storage capacity (FAO 2010)
  - Aiming for self-sustained groups, through subsequent actions such as collective marketing of produce and lobbying through farmer networks, savings groups and other associations
  - The FFS itself does not need to be sustained, however, the impact of FFS, including farmers’ capacities to do farmer to farmer extension and to look for further knowledge providers.
- **Well-defined target group:** The target group is defined as the most vulnerable small-scale farmers, especially poor and marginalised households. This can be returnees, host communities or former IDPs[43].
- **Structure of farmer groups:** The majority of groups is well structured:
  - All groups have relevant positions;
  - Women also hold some of these positions;
  - FFS-records are kept by the secretary in some groups;
  - The groups meet regularly;
  - Most of the FFS have one or two strong members who are capable of taking over the role of a lead farmer in the future; and
  - Graduation process at the end of a season long training course.

[41] Focus group discussion with the Sobeta FFS group, Morobo County, 14/08/12

[42] Focus group discussion with the Alotto FFS group, Morobo County, 24/08/12

[43] Expert interview with agricultural advisors of GIZ DETA, Morobo County, 18/08/12

- **Motivation of farmer groups:** The majority of groups are well motivated. The rate of participation is 60-85%[44] according to the master trainer and 95% according to the facilitator from the Sobeta farmer group[45]. On average, more than two thirds of the group members participate in the activities. Farmers described a common interest. As motivation to participate in the FFS, farmers mostly named:
    1. Unity as a group / help each other / learn from each other (8 of 11)
    2. Knowledge / training (7 of 11)
    3. Improve livelihood / help their families (5 of 11)
    4. Improve agricultural practices / modern agriculture (5 of 11)
    5. Produce together / market together (4 of 11)
- **Support by local authorities:** The CAD and local government offices on the County level support FFS through words and ideas. Also the majority of head men support the approach. This is a precondition for proper functioning.
- **Adequate resources and logistical support by GIZ DETA:** Both resources, in terms of quantity and quality of staff, as well as adequate logistical support are sufficient.
- **Monitoring and evaluation:** A first version of an M+E system for the FFS activities is in place and is used for assessing the first season as described in chapter 4.1.4.

Weaknesses

- **Long-term strategy:** An exit-strategy for GIZ DETA's intervention and the FFS activities is in the process of development. The idea is that lead farmers will graduate and act as facilitators during the forthcoming FFS season. Nevertheless, (a) farmers who have the potential to become lead farmers did not participate in ToT modules during the first season as planned; (b) the take-over of services provided by GIZ DETA by local stakeholders in future has not yet been planned; and (c) there is no contribution system generating any kind of payment for given services.
- **Lack of knowledge:** Persons that hold positions in the group (e.g. treasurer or chair person) lack knowledge on how to fulfil their responsibilities. This is due to illiteracy and lacking skills such as accounting, documentation or leadership skills. Records are not yet used systematically for the learning process of the group.

[44] Expert interview with AAO, Morobo County, 20/08/12

[45] Workshop with facilitators of FFS, Morobo County, 05/09/12

- **Motivation of farmer groups:** The master trainer, some facilitators[46] and the County Agriculture Commissioner[47] see the need for improvement of farmers' motivation. The women at Reno wish to exclude unmotivated people from the FFS[48]. Some groups hope for a better sense of unity in the future[49]. In addition, farmers often have high expectations of the output of the FFS[50]. If these expectations are not met, farmers may lose their motivation.
- **Support of local government authorities:** Only a low level of linkage to the Ministry of Agriculture (MoA) is provided through the CAD and no clear policy to improve small scale farmers' livelihood is present yet. Furthermore, donor coordination in the agricultural sector is lacking.
- **Adequate resources and logistical support by GIZ DETA:** In general facilitators seem to be slightly dissatisfied with their situation. Reasons include their logistical equipment such as bicycles, their incentive package, the short duration of their contract and limited career possibilities. Some also mentioned a heavy workload and a lack of time to visit individual farmers. However, the weakness is also the process of understanding the role of being a facilitator rather than an extension worker. BEW expect to be on GIZ DETA's payroll, because they are not paid by the ministry.
- **Monitoring and evaluation:** The evaluation of theToT, facilitators and implementation on the farmer's level is one of GIZ DETA's management tasks but until now has been carried out by AAO. At the moment there is no staff employed for the M+E of project activities and proceedings.

Opportunities

- **GIZ FSAD:** To link farmers groups to GIZ FSAD can be of great advantage by connecting agricultural producers (even those participating in GIZ DETA project) to potential buyers.
- **Existing group structures:** GIZ DETA's focus on pre-existing groups facilitates the start of activities and the establishment of rules and responsibilities within the group. In most cases, an adequate number of women are part of the groups. Farmer groups stated that a mixed composition has a positive effect on the unity and performance of a group.

[46] Workshop with FFS facilitators, Morobo County, 05/09/12
[47] Expert interview with CAD, Morobo County, 22/09/12
[48] Focus group discussion with the Reno FFS group, Morobo County, 14/08/12
[49] Focus group discussion with the Reno FFS group, Morobo County, 14/08/12
[50] Kick-off-workshop, Morobo County, 07/08/12

Threats

- **Short planning horizon:** The funding and thus the short planning horizon make it especially difficult to develop a long-term strategy for GIZ DETA's interventions. However, improving small scale farmers' livelihood based on sustainable agriculture needs a longer term intervention perspective. For more details, please see the discussion in chapter 7.1.
- **Lacking resources of GOSS and CAD:** The CAD in Morobo County, as well as the GOSS in general, does not have the resources to build and maintain an efficient farmer-oriented agricultural extension service. Furthermore, the GOSS does not yet have a coherent agricultural policy to guide the development of small scale farmers' livelihood systems.
- **Lacking resources of AAO:** AAO is a small local organisation and the only service provider for agricultural training in the region. AAO is also active for other donors and may reach its limits when it comes to intensifying its engagement in FFS activities. According to the master trainer, he updates his knowledge mainly via the internet. However, he is in a continuous learning process by interacting with and advising a range of other actors and their approaches, such as the FAO or the MoA.
- **Motivation of young people:** The motivation to carry out farming seems to be low amongst people with little knowledge on agriculture and its potentials. This is especially true of young people. Young people migrate from the countryside to urban centres, as they perceive the countryside as an unattractive area to live. Agriculture is seen as a burden. As a result, food production is based mostly on old people and women; this leads to the threat of food insecurity. Even so, people who enjoyed a good education e.g. during their time in refugee camps in Uganda are highly motivated[51].

4.2.4 First Successes and Impacts

One has to bear in mind that the following successes and impacts were achieved after completing the first FFS season only . In two out of three impact rankings done with FFS groups, **knowledge increase** was named to have the largest effect. When asking farmers what they have learned, in seven out of eight cases farmers answered "to plant in rows". Farmers from the Reno FFS stated that planting in rows makes weeding easier. Furthermore, they expect bigger harvests. This is a first success especially given that many individual farmers stated that they implement this

[51] Expert interview with CAD, Morobo County, 22/09/12 and AAO, 20/08/12

technique on their home field. Four out of eight farmer groups named knowledge on weeding and planting across the slope. Proper spacing, as well as pest and disease management, were named three times. The following aspects were mentioned one or two times:

- Legumes and fallow crops
- Land opening, deep ploughing, mixing up soils vs. burning
- Crop rotation
- Dividing the land into different plots
- Helping each other on the fields
- Planting to see differences
- Seeds per hole
- Intercropping

Four groups were asked which practices and techniques they are already **implementing in their individual fields**. All four groups named planting in lines and two groups named fencing with local material. All other practices implemented were named by only one group:

- Weeding
- Crop rotation
- One seed per hole
- Intercropping
- Planting across slope
- Clearing
- Improved harvest
- Calculating products

Example: Good Practice

The Alotto FFS[52] group has named and ranked the following aspects according to its importance:

1. Training; 2. Feeling of unity; 3. Exchange knowledge; 4. Growing on real plots ; 5. Practice proper spacing; 6. Practice mulching; and 7. Facilitation of communication.

The two **social impacts** that were named are increased group unity and support of each other on the fields[53]. The FFS group Bakoubiki even named an economic impact, namely that the income generated out of improved practices enables them to pay school fees[54]. Apart from a few real impacts, a lot of expectations were mentioned. E.g. Sobeta as well as Reno expect to have higher food availability and higher yields soon[55].

[52] Focus group discussion with the Alotto FFS group, Morobo County, 24/08/12

[53] Focus group discussion with the Alotto FFS group, Morobo County, 24/08/12 and the Sobeta FFS group, 14/08/12

[54] Focus group discussion with the Bakoubiki FFS group, Morobo County, 17/08/12

[55] Focus group discussion with the Sobeto FFS group, Morobo County, 14/08/12 and the Reno FFS group, 14/08/12

5 Results Magwi County

The situation analysis (chapter 5.1) in Magwi County (Eastern Equatoria) followed a systematic approach, based on findings from Morobo County (Central Equatoria) concerning the situation of existing support structures and problems/opportunities faced by farmer groups. The assessment for establishing FFS (chapter 5.2) checked the completion/non-completion of a list of establishment criteria (see chapter 3). It includes necessary ground working activities, farmers' needs and capabilities, and the motivation and commitment of farmers to become part of a FFS. The assessment also checked the existence/non-existence of public and private service providers (master trainer, facilitators, research institutions, agricultural input providers, market information brokers, mechanical servicemen, and credit services) needed to establish a FFS approach and for other actors engaged in development assistance that could join forces with GIZ DETA to roll out a coordinated intervention to increase farmers' income.

5.1 Situation Analysis

5.1.1 Target Group

GIZ DETA's target group are small-scale farmers who have the potential for surplus production. At the moment 40 farmer groups receive emergency support in terms of seed and tool distribution. Each of these groups consists of 20 to 25 people. Most of the members are returnees from neighbouring Uganda whose repatriation was complete by 2008/2009. The Madi and Acholi people (two ethnic groups that returned) fought out violent disputes in 2011, which erupted over claims to ancestral land. Given a long history of violent retaliations between the Madi and Acholi, the Government of South Sudan decided to establish two separate administrative corridors for each group, a Madi-led administration in Pageri Payam and an Acholi-led administration in Magwi Payam. Of the 40 farmer groups that currently receive support from GIZ DETA, 20 are situated in the Madi corridor, the other 20 in the Acholi corridor.

5.1.2 Farming Systems

Agro-ecological Data

Altitude: Magwi town is situated 900m above the sea. To the east of Magwi town there is a mountain ridge that rises up to 2500m. This mountain ridge demarcates the Acholi land. To the west and south of Magwi town, the relief lowers into a plain, which demarcates the Madi land. The Madi corridor between Nimule and Pageri is situated at an altitude of 600 to 700m.

Rainfall: The climate and growing period in Magwi County are similar to that of Morobo County. Rainfall has a bimodal distribution with an annual quantity of 1100 to 1300 mm per year (WFP 2012). The first rainy season occurs from April/May to July, the second rainy season from September to October/November. Answers from group interviews indicated that the Acholi corridor receives more rain than the Madi corridor. This circumstance may be explained by orographic rainfall due to the mountainous microclimate in the Acholi corridor. The observation of tropical, moist vegetation cover (e.g. epiphytes on trees) in Obbo and Palotaka, indicate that the mountains to the east of Magwi town also receive more rain than farmland in Morobo County.

Soils: Magwi County is dominated by "Alfisols" as indicated by USDA's "Soil Map of Africa" (USDA/NRCS 1996)[56] (See Annex 13). Alfisols are common soils for semi-arid areas, particularly at the border with the dry savannah zone. Alfisols are well structured and can be used for agriculture if irrigated (McGregor 2008).

Based on expert interviews, heavy and loamy soils dominate the Acholi corridor around Magwi town and towards the Palotaka and Parajok Mountains where vegetation is made up of a mosaic of dense tree and bush cover. Soils become increasingly sandy towards Nimule in the Madi corridor where the landscape changes into open bushland savannah.

Dry Season Activities

Suitable areas for dry season agricultural production are limited. The best sites for dry season vegetable production include:

1) The floodplains of the White Nile

2) The Ayii river, Atepi river, Aswa river; and

3) The Montane valleys in the Acholi corridor / Magwi Payam

Only these locations make up exclusive permanent wetland sites. Expert interviews estimated that only 10% of farmers in Magwi and Pageri are currently engaged in dry season vegetable production. Given the location of farmer groups supported by GIZ DETA at the moment, there is limited potential to promote dry season vegetable production**.** Only 5 out of the 40 existing farmer groups have access to the above mentioned water points.

Typical Food and Cash Crops

Cassava, maize, and sorghum are major food crops for farmers in Magwi County. The reasoning behind this choice was the same as in Morobo County. Other than

[56] The starting point for USDA's (1996) "Assessment of the Soil Resources of Africa in Relation to Productivity" was FAO-UNESCO's soil map of the World (1977) in addition to various other soil data resources (See: USDA/NSRC 1996)

that, sweet potatoes were mentioned as an additional and important staple crop in Magwi County[57].

Cassava, maize, sorghum, and sweet potatoes are also used as major cash crops. Other crops that were identified for their potential to earn an income were millet, sesame, groundnuts, beans, onions, cowpeas, cabbage, bananas and tomatoes[58].

Livestock Farming

In a similar way to Morobo County, farmers are not involved in livestock activities on a commercial basis. Livestock is mainly kept as collateral in Magwi County. Poultry and goats are commonly raised for that purpose. Cattle is used for fixing and liquidating larger sums of money. Few farmers have mentioned possessing cattle in Magwi County.

Farm Sizes

Farmers indicated that they were able to access much more land than they are currently cultivating. With reference to clan land allocated by the boma chiefs, farmers were able to estimate the area they are allowed to access and to use. The most common answer was that accessible land measured two to three times the size of currently cultivated land.

Cultivation Capacities

The GIZ DETA project in Magwi County covers small-scale farmers with different cultivation capacities. Out of 22 interviewed farmers, only 2 cultivated 0 to 1 feddan. 7 out of 22 farmers cultivated 1 to 3 feddan. The majority of farmers were able to cultivate 3 to 6 feddan, whereas only 3 out of 22 farmers cultivated more than 6 feddan. This is different to Morobo County where the most prevalent cultivation capacity was in the range of 1 to 3 feddan (see frequency distribution in Annex 17).

Market Access

Overall, farmers' market access situation is better than in Morobo County due to a new tarmac road between Nimule and Juba. This road has the potential to link farmers to high value markets such as Juba, Nimule, Torit, Kit, Owiny, Amee Junction, Kerepi, and Pageri, where crops are sold at higher prices per basin than along the feeder roads. Yet, farmers lack improved storage facilities as well as means of transport. Thus, the above mentioned markets currently cannot be supplied: Like in

[57] Focus group discussions with farmer groups supported by GIZ DETA, Magwi County, October 2012

[58] Income expenditure matrices conducted with farmer groups supported by GIZ DETA, Magwi County, October 2012

Morobo County, the majority of communities lack group / adequate storage facilities. Consequently, farmers sell and market their yields as individuals for now. Farmers only sell bulk produce from commercial group plots. This kind of bulking typically happens on transport day. Storage of individual yields occurs at home. Most farmers store their grains in sacks inside their house or in traditional grass-thatched granaries outside their home. Due to small quantities of stock, traditional storage facilities are inappropriate to attract wholesale buyers or transport middlemen.

Farmers' Knowledge

Awareness of farming as a business is widespread among farmers in Magwi County compared to farmers in Morobo County. During the time in exile in Uganda, farmers from Magwi County have seen that agriculture can be a profitable business. Back in South Sudan, many of the farmers now want to copy what they have seen in Uganda, for example: cultivating larger areas with a fair degree of mechanisation, storing and transporting bulk quantities, or adding value to raw materials by simple processing. In contrast to the situation in Morobo County, farmer groups in Magwi and Pageri expressed clear visions for farm-related income generating activities.

Example: Farm-related income generation envisioned by farmers in Magwi

One group had the vision of rearing small livestock as a business. Another wanted to establish a grinding mill in an under-serviced village, while yet another wished to become a marketing cooperative with the idea of buying vegetables from neighbouring farms to transport these products to high value markets such as Juba, Kit or Torit to generate income for their group members.

5.1.3 Livelihood Systems

Like in Morobo County, the main income of the population in Magwi County is small-scale agriculture. But in contrast, the **income expenditure matrix** of two groups in Magwi County showed a higher percentage of income generation from off-farm work compared to farm work. Whereas in Morobo County the ratio was about 1/6 off-farm and 5/6 farm work, the ratio in Magwi County was 1/3 off-farm and 2/3 farm work. The most valuable crops for both groups were cassava, maize, sesame, onions, millet, groundnuts and cowpeas.

In Magwi County, charcoal burning was the most valuable **off-farm activity** followed by working on other farms. In Morobo County charcoal was also attractive but not the most valuable. The Mikawiru group also rated tailoring as high whereas the Can Dak Ming group generated high income from cutting and selling bamboo. The other average and less important activities for both groups are cutting grass for sale, bricklaying and selling firewood. The Can Dak Ming group has the highest overall degree of di-

versification of all the interviewed groups, naming 24 crops and 11 non-farm activities for income generation.

Like in Morobo County, the **main expenditures** of the two groups in Magwi County are school fees, healthcare and food. In contrast to Morobo County, expenditure related to marriage plays an important role whereas spending on animals is less.

In both groups, women scored higher in total and average income scores than men. At the same time women scored lower in total and average expenditure score. In Morobo County this pattern appeared again in three out of four groups.

Vulnerability Context

Food Security: In contrast to Morobo County, heavy rain is not a major problem for farmers but instead periodical drought is, particularly in the Madi corridor. Households cope with dry years by increasing their dependence on root crops and exchange. The most vulnerable months are May, June, July as well as October and November when the stores are emptied and food prices increase. Like in Morobo County free ranging animals are a problem, especially during the dry spell. There were no reported incidences regarding natural risks, sources of insecurity or major communal conflicts. No interviewed farmer groups felt insecure carrying out agriculture.

5.1.4 Government Strategy and Policies

There is no Government policy for agricultural development that currently extends down to county level. As a result, the CAD in Magwi County does not provide development organisations with clear guidance on intended goals for agricultural development. Coordination of NGOs and other donors by the CAD is limited to the identification of under-serviced villages. Alignment options for donors to government strategies are not clearly communicated by the CAD. As a consequence, development organisations and foreign donor agencies largely follow their own visions and respective geopolitical ambitions at the moment. Donors operate without mutual communication and minimal coordination of activities.

Example: Different visions of agricultural development by USAID and GIZ DETA

"Farm Sudan" (USAID)[59] has the vision to increase agricultural production in the Greenbelt by deploying high yielding varieties (including hybrid seeds) and corresponding packages of inorganic fertilisers. The strategy is one of promoting conventional agriculture. "Farm Project" is the capacity-building arm of Farm Sudan (USAID). "Farm Africa" and IFDC (International Fertilizer Development Center) are

[59] Expert interviews with agricultural advisors of GIZ DETA, Yei County, August 2012

part of Farm Project. They are all funded by Farm Sudan (USAID). Farm Africa initiates Farmer Field Schools and links farmers to the market. IFDC helps to set up Agro-Voucher-Dealer shops in local villages.[60] Targeted farmers are given seeds and fertiliser at a value of 1092 SSP per feddan, of which they need to pay 92 SSP themselves in the first season. The share the farmer has to pay for this input will rise successively with subsequent seasons of support. Farmers are told that the combination of hybrid seeds and inorganic fertilisers can "double their yields"[61], from currently less than 800 kg per ha for cereals (GOSS 2011: p.1).

GIZ DETA, by contrast, sets up Farmer Field Schools with the aim of increasing farmers' agricultural productivity based on the agronomic principles of Low External Input Agriculture (LEIA). GIZ DETA aims to increase food security by increasing agricultural production. Furthermore, GIZ FSAD provide farmers with training sessions on "Farming as a Business" to explore new marketing channels and income options. GIZ FSAD focuses on food security at a national level.

5.2 Assessment for Establishing FFS

In order to assess the transferability of lessons learned from a FFS approach from a pilot phase in Morobo County, Central Equatoria state to Magwi County Eastern Equatoria State, specific criteria need to be considered. The following chapter describes the main findings and lessons learnt in Magwi County.

Logistical Support and Adequate Resources

Adequately experienced project staff in the field of conflict mediation and project management is an important criteria, especially in Magwi County with regard to the Madi and Acholi conflict. Currently 40 FGs are supported, 20 from each ethnic group. At the same time, the agricultural staff of GIZ DETA in Magwi County consists of three agricultural supervisors, from which two are from the Kajo Keji tribe and one is Acholi. One member of GIZ staff will move to the Madi corridor soon in order to ensure better coordination. Nevertheless, GIZ staff does represents the proportion of Madi and Acholi within their staff. Namely there are too few Madi speaking people according to the mentioned conflict. Two of the staff members joined the team only recently. All of them have degrees in agriculture. There are no community mobilisers but one member of staff has knowledge about societal issues, which are also important for an FFS implementation. Staff has no practical experience with FFS so far, so there is a high potential for further learning in this area.

[60] Expert interview with the agricultural inspector at CAD, Magwi County, October 2012

[61] Expert interview with the Farm Project facilitator , Magwi County, October 2012

Actors' Landscape

Table 12: Actors landscape Magwi County

Organisation	Activities
SNV	South Sudan Livelihood Development Project (SSLDP) • Crop production • Small business development • Goat rearing • Metalwork / blacksmith • Beekeeping
AGRI-CA UK	• Soil and water testing
Palotaka Seed Centre	• Capacity building • Seed multiplication • Crop breeding
FAO	• Operating from Torit • Formerly cooperating with DED on FFS establishment
The FARM Project	• Capacity building • Crop production • Small grants
Farm Africa	• Up-scaling of cassava production
IFDC	• Crop production
Legend	
	potential partners
	organisations following other visions than GIZ DETA

Potential Roles for the Implementation of a FFS Approach

For the successful implementation of FFS, a list of services is needed. Possible providers of these services are listed in Table 13.

Table 13: Potential service providers Magwi County

Service	Stakeholder
Coordination	GIZ DETA, CAD, MoA
Content	GIZ DETA, SNV, Palotaka Seed Center, CAD, MoA
Training of master trainer	AAO Morobo, GIZ DETA, FAO
ToT	FAO, SNV, Palotaka Seed Center
Facilitators	Extension worker who has been trained by CAD
Follow up	1 GIZ DETA staff for M+E
Inputs	GIZ DETA, FAO, SNV, Palotaka Seed Center, CAD

Storage	WFP, FAO
Markets / Market information	No service provider identified
Transport	No service provider identified
Processing	Some private grinding mills. No further service provider identified
Access to loans	No service provider identified
Stakeholder exchange	CAD in cooperation with GIZ DETA

Ground working Activities (GWA)

When an appropriate team is created, the implementation of GWA is necessary before the FFS can be started. No ground working activities have been conducted in Magwi County as yet. There is not yet any plan for the time, responsibilities and resources required.

Long-term Success

In order to ensure a long-term establishment of FFS, the team defined four criteria under which the findings of Magwi County are summarised.

Concerning the aspects of the **motivation of farmer groups** found for Morobo County in chapter 0, these are also relevant for Magwi County. The following text adds experience and concrete examples from Magwi County. Regarding the question why the group members carry out agriculture, they mentioned reasons of heritage, tradition and basic livelihood to survive "*There is no life if you are not digging*"[62].

Example: Agricultural commitment and additional training

All groups wanted to stay in agriculture for the subsequent years. The Chan Dak Ming group wants additional training in “tailoring”[63]. Mikawiru named “training in horticulture[64]”.

A negative impact on motivation to carry out agriculture lay in the access to the Juba-Nimule road and the upgrading of the Amee feeder road, making it accessible for trucks. This ensured better market access but also made charcoal burning, which is an unsustainable, quick-money business that particularly attractsyoung people.

As **motivation to form groups,** farmers mentioned that “alone you cannot achieve as much as in a group”[65], whereas the level of group integration ranged from com-

[62] Focus group discussion with the Chan Dak Ming farmer group in Panjume, Magwi County, 01/10/12
[63] Focus group discussion with the Mikawiru farmer group in Mugali, Magwi County, 03/10/12
[64] Focus group discussion with the Ket Chan Itich farmer group in Obbo, Magwi County, 05/10/12
[65] Focus group discussion with the Chan Dak Ming farmer group in Panjume, Magwi County, 01/10/12

mon marketing, paying school fees and healthcare up to "sharing production tools, input and seeds"[66].

Exemplary: Deep understanding of group dynamics

In addition to the above mentioned features, the Ket Chan Itich farmer group had a wide-ranging understanding of group processes, mentioning "common investments" as well as an "exchange of ideas"[67].

The GIZ DETA Magwi staff had the same perception and added the "easy to access to services and help"[68]. This also fits the observation that farmers 'expectations of vis-à-vis NGOs and other donors are high. In contrast to Morobo County, most farmers had been in exile in Uganda and were motivated to carry out farming as a business. The groups had visions for concrete income-generating activities like "buying a grinding mill for processing"[69] and a "water pump for dry season vegetable production"[70]. The motivation to participate in a FFS was high in all groups. A negative impact might be the fact that GIZ services delivered in 2011 were not positively appreciated by 15 out of 40 individuals due to farmers' high expectations of material support, which was only partly met by the DETA project.[71]

Organisational Structure of Farmer Groups: According to the Magwi staff, the GIZ DETA farmer groups are not yet registered at state level. A detailed list of the composition and membership of each group is available. All interviewed groups had the main positions of a chairman, a secretary and a treasurer. Group rules also existed that for example monitored attendance.

Support of FFS by local authorities: On the question "would your boma chief support the organisation of farmers in FFS groups?" all groups answered yes. So the non-material support of FFS was given. The CAD also supported FFS but did not grasp the whole FFS concept, rather seeing the top-down way of training groups in it. Material support by local authorities, communities or the CAD is nearly non-existent. In Obbo, a boma chief assigned community land to a group that at the same time was rated negative from SNV since the fear that he can take it away rather decreases group efforts. The CAD is not well equipped either in trained staff or resources.

[66] Focus group discussion with the Ket Chan Itich farmer group in Obbo, Magwi County, 05/10/12.

[67] Focus group discussion with the Ket Chan Itich farmer group in Obbo, Magwi County, 05/10/12

[68] Expert interview with GIZ DETA staff, Magwi County, 06/10/12

[69] Focus group discussions with the Dongo Lobo and Ket Chan Itich farmer groups in Obbo, Magwi County, 05/10/12

[70] Focus group discussion with the Mikawiru farmer group in Mugali, Magwi County, 03/10/12

5.3 Summary for Magwi County

Key similarities between the situation in Magwi and Morobo County include the following:

Table 14: Key similarities between Magwi and Morobo County

Subject	Findings and conclusions
Target group of GIZ DETA	The target group of GIZ DETA is made up of small-scale farmers with little to no knowledge on modern farming techniques and very low financial capacity but access to sufficient land with high agricultural potential. There is bimodal rainfall and agricultural land is characterised by recently opened areas with highly fertile, virgin soils.
Farmers' basic knowledge	Basic knowledge of improved agricultural practices exists among farmers who spent their time in exile in Uganda. Some farmers expressed a high interest in farming for commercial purposes and related value-adding steps. These farmers had specific visions for farm-related income generating activities.
Market access potential	Market access is limited due to bad feeder roads, inadequate storage capacities, and inaccessible transport services. Consequently, farmers sell produce almost exclusively on local markets along the feeder roads where prices are considerably lower than along national roads, which join up central towns.
Local food security	The CAD recognises the necessity to promote agricultural development to improve local food security. Supplying the national market with food is a secondary priority for now.
Coordination by the CAD	The National Government of South Sudan (GOSS) lacks an agricultural strategy that extends down to county level. Consequently, the CAD in Magwi County has limited capacity to coordinate development assistance. As a result, foreign development agencies follow their own ambitions without aligning their agricultural interventions or fostering mutual coordination among their projects.

Key differences between the situation in Magwi and Morobo County include the following:

Table 15: Key differences between Magwi and Morobo County

Subject	Findings and conclusions
Conflict potential	Development interventions in Magwi County hold an elevated conflict potential due to existing social tensions between Madi vs. Acholi people who make up the target group.
Market access potential	Due to the existence of the Nimule to Juba tarmac road there is better market access potential in Magwi than in Morobo County.
Farming as a business	Compared to Morobo County, there is an elevated awareness among farmers in Magwi County that farming can be a profitable business.
Farmers' expectations	As a result of having received emergency relief for many years, farmers' expectations of unconditional material support appears to be higher in Magwi than in Morobo County.

6 Results for Yambio & Nzara County

The situation analysis (chapter 6.1) in Yambio & Nzara County (Western Equatoria) followed a systematic approach, based on findings from Morobo County (Central Equatoria) concerning the situation of existing support structures and problems/opportunities faced by farmer groups. The assessment for establishing FFS (chapter 6.2) checked the completion/non-completion of a list of establishment criteria (see chapter 3). It includes necessaryground working activities, farmers' needs and capabilities, and the motivation and commitment of farmers to become part of a FFS. The assessment also checked for the existence/non-existence of public and private service providers (master trainer, facilitators, research institutions, agricultural input providers, market information brokers, mechanical servicemen, and credit services) needed to establish a FFS approach and for other actors engaged in development assistance that could join forces with GIZ DETA to roll out a coordinated intervention to increase farmers' income.

6.1 Situation Analysis

6.1.1 Target Group

The study group found that GIZ DETA encourages subsistence-based, small-scale farmers, who have potential for surplus production. At the moment 99 farmer groups and more than 2000 individual farmers received support in terms of seeds and tools. Around 100 farmers receive training on vegetable or staple crop production, both theoretically and practically. Since their return, two out of four farmer groups have already produced a surplus. GIZ DETA supports host communities as well as returnees and IDPs affected by the Lord's Resistance Army (LRA). Most returnees came back at the beginning of 2012. However the repatriation of IDPs from the town centres of Nzara or Yambio is not yet complete.

6.1.2 Farming Systems

Agro-ecological Data

Altitude: Yambio is situated around 630m above sea level.

Rainfall: The study team was not able to acquire detailed rainfall data. However, the region is reported to have one long rainy season, starting in late February/early March and ending in October. The rainy season has its peak in April. Between July and October there is less rainfall than between April and June. In August, rainfall is low. However in total humidity is higher than in Morobo County. The seasonal rainfall is more than 1500mm per year in Yambio & Nzara County (WfP 2012). Observations

of tropical moist vegetation cover (e.g. epiphytes on trees) is consistent, with more rain than in Morobo County. However, Yambio & Nzara County also face a longer dry season. While it rains up to December in Morobo County, the rain in Yambio & Nzara County already ends in October[72]. Almost every farmer group has mentioned facing water shortage problems for drinking or farming during some months of the year. Even the occurrence of droughts has been mentioned, such as in 2011.

Soils: Oxisols dominate the area around Yambio and Nzara (USDA/NSRC 1996) (see Annex 13). Oxisols are highly weathered soils that often contain a great deal of Fe (iron) and Al (aluminium) oxide minerals.

> "*Most of these soils are characterized by extremely low native fertility, resulting from very low nutrient reserves, high phosphorus retention by oxide minerals, and low Cation Exchange Capacity (CEC). Most nutrients in Oxisol ecosystems are contained in the standing vegetation and decomposing plant material*." (University of Idaho; no date)

Dry Season Activities

Only farmer groups that are located close to large river banks have access to water in the dry season. Even small rivers dry out completely. According to GIZ DETA staff, 20 out of 200 farmer groups are in this favourable situation. In general, only a few farmers are involved in dry season activities and there is a low potential for dry season vegetable production.

Typical Food and Cash Crops

A recent baseline report conducted in February 2012 presents the main crops to be groundnuts, sweet potatoes, cassava, maize, pumpkins and millet. The most important crops for generating cash are groundnuts, maize, cassava, and pumpkins (Rosenbrock 2012). Results from the income expenditure matrix confirm these cash crops, but also present sorghum, millet, rice and fruit, especially bananas, oranges, mangos and pineapples as being major crops for income generation[73]. The baseline study and the teams' findings show that there is potential for coffee, sugar cane, beans, sesame and palm oil (Rosenbrock 2012)[74]. Plantations of coffee and oil palms from the past prove the potential there. Some of them were destroyed during the time of the LRA's activities.

[72] Focus group discussions, Yambio and Nzara County, October 2012 and expert interviews with World Vision, Yambio County, 09/10/12

[73] Focus group discussions, Yambio and Nzara County, October 2012

[74] Focus group discussions, Yambio and Nzara County, October 2012

Livestock Farming

Livestock farming is for subsistence in most cases. Poultry and goats are commonly raised for that purpose. Only very few farmers mentioned owning cattle. Traditionally farmers are not involved in livestock activities[75]. Livestock activities are less prominent than in Morobo County. Fewer animals are found due to more vegetation and a lower population density. Animals are tied up during the rainy season, which reduces the risk of roaming animals destroying crops.

Farm Sizes

Every farmer indicated that they were able to access much more land than they are currently cultivating. Most of them were not able to estimate the area they own, because it is so large. This might be linked to the low population density in Western Equatoria State (UN OCHA 2009).

Cultivation Capacities

The GIZ DETA project assists small-scale farmers with different cultivation capacities. Out of 23 farmers, 2 cultivated just 0 to 1 feddan, whereas eleven farmers cultivated 1 to 3 feddan and seven farmers 3 to 6 feddan. This is in contrast to Morobo County, where farmers cultivate an average of 2 to 3 feddan and three farmers cultivated over 6 feddan (see frequency distribution in Annex 17).

Market Access

Market access determined by road infrastructure, storage capacity, access to affordable transportation, and the recruitment of additional farm labour is a severe challenge. Small local markets do not always function due to the recent displacement situation. Larger markets in the urban centres of Yambio and Nzara are far away and difficult to access for many farmers. The study team did not meet any farmer group that had a group storage facility. In addition, almost no trader comes to buy directly at the farm gate[76]. Yambio Farmers Association (YAFA), which acts as a middleman said that transport can be very expensive for traders[77] due to the bad condition of small feeder roads. With the exception of YAFA no trucks are available to transport higher amounts of produce. Also, there are no large processors, there are just a few

[75] Expert Interviews with GIZ DETA, FAO and RDAA, Yambio County, 08/10/12, 09/10/12 and 28/09/12

[76] Focus group discussions, Yambio and Nzara County, October 2012

[77] Expert interview with YAFA, Yambio County, 03/10/12

very small motorised grinding mills in town centres, which are mostly for consumption[78].

As a result, produce spoils due to inadequate market access[79], which can have a negative effect on the farmer's initial motivation due to frustration. In addition, access to improved seeds is a challenge. Farmers use their own seeds in most cases.

A difference to Morobo County is the current high potential for marketing products in urban centres. This is led by high demand, the operation of many organisations in the state capital of Yambio and better road conditions. The planned WFP warehouse in Nzara and the availability of banks, as well as the Green Farmers Microcredit Union, are further opportunities even though conditions for loans deter many farmers at the moment.

Farmers are limited to cultivating a certain size of land due to a low degree of mechanisation. They don't hire tractors. Farmers sometimes hire labour from Congo (refugees). Another difference to Morobo County is that farmers clear and cultivate more land together as a group.

Farmers' Knowledge

Some basic/traditional knowledge on agriculture exists, which has been either passed on in families[80] or has been provided by other organisations operating in the area of Yambio & Nzara County. Some farmers still implement what they were taught and keep doing it on their own.

In addition, they also have partial knowledge on potential cash crops, like coffee, oil palm or teak. Two farmers plant small plantations of coffee, fruit or oil palm. One progressive farmer has a teak plantation. RDAA said "*traditional knowledge is there but needs to be improved*".[81]

The idea of farming as a business is present among many farmers the SLE team talked to. Farmers plan what to use their land for (sale, consumption, seeds) and how to use and invest their generated profits. Groups even open bank accounts and apply for loans.

Another difference to Morobo County is that farmers are traditionally less involved in the cultivation of beans[82]. This fact can be proven by the baseline study that indicated main food and cash crops (Rosenbrock 2012). Group interviews and interviews

[78] Expert interview with RDAA, Yambio County, 28/09/12 and focus group discussions, Yambio and Nzara County County, October 2012

[79] Two out of four groups reported this situation

[80] Two out of three interviewed progressive farmers

[81] Expert interview with RDAA, Yambio County, 28/09/12

[82] Expert interviews with FARM project and GIZ DETA, Yambio County, 05/10/12 and 08/10/12

with progressive farmers have shown that the majority of farmers are unable to store their produce in an adequate way due to no or little knowledge on post-harvest handling. Products are mostly stored at home and sometimes outside the house in traditional granaries.

6.1.3 Livelihood Systems

Farming is the main source of income at present for all the farmer groups and individual farmers who were interviewed[83]. This was also confirmed by statements made by experts such as GIZ DETA staff, the local CBO Rural Development Action Aid (RDAA) and Yambio and Nzara CAD. Both farmers and experts expect farming to continue to be the main source of income for the target group in the future. For the main food and cash crops see above.

Nevertheless, various **non-farm sources of income** were named in the two Income Expenditure Matrices conducted with the farmer groups in Nangume and Ringasi. Participants of both groups named charcoal burning, making honey, brewing alcohol and working on other farms as very important, and working as blacksmiths, making furniture and pottery as other sources of income. In Nangume, other important sources of non-farm income are palm oil production, timber, cutting grass for sale, fetching water, and working as a driver or guard. The participants in Ringasi additionally named hunting wild animals, bricklaying and repairing bicycles to be important. Even though both groups ranked most non-farm sources of income as important, they still stated that overall farming remains much more important for generating income.

When it comes to **expenditure,** this was similar to Morobo County, with school fees, health, clothing, food and household items ranking among the highest. Unlike Morobo County though, labour, animals, funerals and church are also among the highest ranking expenditures.

One notable difference between men and women is the fact that women generate very little income from non-farm activities whereas men engage in various activities that yield high income. These include timber, honey, hunting wild animals, working on other farms and handicrafts such as making furniture, pottery and blacksmith.

Vulnerability Context

Food security: Like Morobo County, 3 out of the 4 farmer groups interviewed stated that they have a lean period from May until June or June until July. During this time the stores are emptied but the new harvest is not yet available. Thus farmers mostly

[83] Focus group discussions, Yambio and Nzara County, October 2012

eat just one meal per day instead of two. The interviewed groups could not name any additional sources of income that are made use of in this period, like certain types of non-farm work or liquid assets such as livestock.

As potential **natural risks** the farmer groups named the lack of water, both for drinking and farming. Unreliable weather conditions in general, such as strong winds or rainfall and droughts as in 2011, were named by farmer groups and experts (RDAA). Finally, human diseases pose a danger for the farmers. Respective human diseases were not specified in the interviews and need to be investigated in the future.

Possible **sources of insecurity** include the activities of the LRA in the region. Even though there are no activities at this point in time, some farmers still fear their presence. This is especially true for farmers who have to commute long distances to their farms – the distance between the homestead and farm can be up to 7 miles among the farmers interviewed. There are two reasons for the long distances: Firstly, some farmers practice shifting cultivation, forcing them to open land further away from their homesteads as is the case in Ringasi; Secondly, government regulations for some Payams prohibit people from living far apart due to safety concerns regarding possible LRA activities in the future. As a consequence, many farmers could not return to their original homesteads that are close to their fields and instead had to settle in nearby villages.

No major sources of **communal conflicts** were mentioned in any interviews. As opposed to Morobo County, conflicts due to roaming animals did not play an important role due to the low number of livestock and the common practice of tying up livestock during the rainy season. Also interviewees do not expect the formation of FFS to lead to any conflicts in the future, because all communities welcome any kind of support and expect to profit from it, even if not all members can participate.

One possible source of communal conflicts may result from differences in rights of **land ownership.** In general farmers in Yambio & Nzara County base their land ownership on traditional land rights. Farmers stated that normally if somebody returns after displacement and his or her land had been taken in the meantime, the Boma chief will be involved. Land ownership according to traditional land rights will be clarified and the unlawful occupants will be asked to leave. According to the groups this is usually carried out in mutual agreement. The possibility to get official land titles seems to exist though. One progressive farmer[84] has his land title certified by legal documents of the Directorate of Lands and Survey at Nzara County. He registered his land to ensure that nobody else other than his family can claim his land after his

[84] Interview with a progressive farmer, Nzara County, 08/10/12

death. Further research is needed to clarify whether this is an option for other farmers to secure their land rights and avoid potential conflicts in the future.

6.1.4 Government Strategy and Policies

At present, a comprehensive strategy on agricultural development policies from the Yambio and Nzara CAD does not exist. Alignment options to government strategies are not clear to NGOs at the County level. Donor coordination is only in place at state level. As a consequence, development organisations and foreign donor agencies largely follow their own visions and respective geopolitical ambitions at present. They are able to operate without mutual communication or coordination of their activities.

Nevertheless, there are some policies that have an influence on the agricultural sector and are different to the situation in Morobo County. As described in the vulnerability chapter earlier, a governmental law prohibits IDPs from living far apart.

Furthermore, Yambio & Nzara County has a policy that prohibits the use of fertilisers, showing the awareness of the rich natural potential of the area and the level of knowledge farmers have.

6.2 Assessment to Establish FFS

In order to assess the transferability of lessons learned from a FFS approach from a pilot phase in Morobo County, Central Equatoria state to Yambio & Nzara County Eastern Equatoria State, specific criteria need to be considered. The following chapter describes the main findings and lessons learnt in Yambio and Nzara County.

Logistical Support and Adequate Resources

There has been sufficient time to conduct all necessary GWA until March 2013. The project has two qualified agricultural staff and a person in charge of monitoring and evaluation. In addition there are three community mobilisers, who guarantee the functioning of groups. Thus, a good basis of well-educated project staff is available to build on. Means of transport to start activities, as well as other resources and logistics including funds are available to start GWA.

However, there is a lack of someone with in-depth experience in the FFS approach to support the activities now. Furthermore, staff asked for support from GIZ management, because the coordination and leadership in the project is inadequate / suffering due to a restructuring process. Additionally, staff would like to get further training in line with their responsibilities. According to GIZ staff, the high number of farmer groups and individual farmers is hard to manage when aiming for a high-quality service. It has been also mentioned that many activities that were planned and are part of the operational plan have not been implemented yet. Those issues can decrease the motivation in the mid-term.

Table 16: Actors landscape Yambio & Nzara County

Organisation	Activities
WFP P4P	• Construction of warehouses in Nzara County • Possible procurement of bulk produce
RDAA	• Training on sustainable agricultural practices • Training on Farming as a Business • Training for illiterate people in local language under development • Demonstration farm • Health component
YAFA	• Tractor and truck ownership • Bulk marketing • Storage facilities
NAFA	• Function of middleman for marketing • Bulk marketing • Storage facilities
FAO	• Farmer Field Schools Western Equatoria State • Distribution of agricultural inputs • Vouchers for tractor services
Worldvision	• Farmer Field Schools Western Equatoria State • Distribution of inputs • Vouchers for tractor services
The FARM Project	• Training on sustainable agricultural practices • Demonstration plots • Distribution of agricultural inputs
InterSOS	• Humanitarian Aid • Distribution of agricultural inputs
AAH, Cafod, South Sudanese Red Cross, IFDC	• Miscellaneous stakeholder operating in the agricultural sector
Legend	
	Potential partners
	Other stakeholders

Actors' Landscape

The stakeholder landscape is more diverse in Yambio & Nzara County compared with Morobo County, especially when it comes to organisations that are active in the agricultural sector. This is mainly due to the fact that Yambio town is the capital of WES. The most important stakeholders and main activities are listed in Table 16.

Potential Roles for the Implementation of a FFS Approach

For a successful implementation of FFS a list of services is needed. Possible providers of these services are listed in Table 17.

Table 17: Potential service providers Yambio & Nzara County

Service	Stakeholder
Coordination	GIZ DETA, CAD, MoA
Content	GIZ DETA GWA together with master trainer, CAD and MoA
Training of master trainer	AAO Morobo, GIZ DETA
ToT	RDAA, Ragozere Agriculture Training Center
Facilitators	5 PEW in Nzara County, 6 PEW in Yambio County, Community Extension Workers in Yambio County without knowledge on farming, some progressive / knowledgeable farmer, CTC graduates
Follow up	1 GIZ DETA staff for M+E
Inputs	Provision by GIZ DETA, FAO, World Vision, etc.; tools available in the markets; improved seeds hardly available
Storage	Some local individual stores, no group storage, some stores for hire at market places, YAFA, NAFA, future: WFP warehouses in Nzara County
Markets	Some local markets have not been re-established since the displacement due to LRA activities; in general few local markets with low prices
Transport	Some bicycle ownership; YAFA owns a truck
Processing	Grinding mills in Nzara and Yambio, 1 farmer group owns a rice huller but it is not operating due to lack of rice farming
Access to loans	Equity Bank, KCB for accounts; Green Farmers Microfinance Union
Stakeholder exchange	MoA monthly round table with all actors in food security; no platform at county level

Two potential partners for a master trainer were identified. The first is the recently established, local CBO RDAA. The CBO has two major areas of intervention, farming and health. The head of the agricultural unit has in-depth knowledge on sustainable agricultural practices and has worked with FFS in Kenya. The training offered at this point in time cover topics that are comparable to the ones provided by AAO in the FFS in Morobo County, such as land opening, planting in rows and integrated pest and disease management, amongst others. The topics and structure of the individual training sessions were not investigated. In addition, training sessions on Farming as a Business are part of the portfolio. Furthermore RDAA is currently carrying out training sessions in the local language and training sessions for illiterate people. Limitations are the recent date of establishment and the small number of agricultural staff, or more specifically, one person.

A second potential master trainer is the recently established Ragozere Agriculture Training Center in Yambio. The training offered is based on the CTC training sessions in Yei. Graduates receive an official certificate from the CTC in Yei. The capacity to provide training is currently limited though.

Further potential partners for the implementation of FFS in WES are the YAFA and Nzara Farmers Association (NAFA) cooperatives in Yambio and Nzara County respectively, who mainly support their members with marketing issues. Both are potential cooperation partners for the organisation of small scale farmers e.g. for marketing purposes.

The access to storage, transport and markets is very limited, which is similar to Morobo County (see above). The access to loans seems to be slightly better though. Farmer groups that are registered with the CAD can open bank accounts with Kenya Commercial Bank or Equity Bank. This enables them to apply for micro credits with the Green Farmers Microfinance Union. One of the interviewed groups had already applied for the credit, as had the NAFA cooperative. To the knowledge of GIZ DETA staff, no credits have been issued yet but they expect this to be the case in the near future.

Stakeholder exchange / coordination: At state level, the MoA organises monthly coordination meetings for all actors involved in food security. At county level, each CAD normally appoints each organisation to certain Payams or Bomas so that one Boma is supported by just one organisation. Both CADs have limited capacities in terms of staff, knowledge and budget to host coordination meetings at county level. Therefore they can hardly fulfil their duty to actively monitor whether the activities of the organisations are in line with government policies. GIZ DETA informs the CADS about all activities and reports on a monthly basis. But this is not true for other organisations. As a result, not all activities by foreign development agencies are known to the CAD and coordinated properly.

Ground working Activities

Due to the fact that the establishment of the FFS approach in Yambio & Nzara County is just beginning, most of the GWA (see chapter 3) haven't been started yet. However, the target group has been defined as part of the project objective. The defined target group matches the beneficiaries that the study team met, which are returnees and host communities. Nevertheless, IDPs will not get support through FFS. A first baseline study has been carried out and gives initial information on upcoming interventions, such as the returnee situation, main food and cash crops, marketing obstacles and farmers' knowledge on processing. However, detailed information on farmers and groups, such as motivation, preferred crops and further needs are missing.

Factors for Long-Term Success

Motivation of farmer groups is generally high. Farmers are committed to carrying out agriculture. They have a strong sense of ownership of what they are doing and

want to stay in agriculture for the long-term[85]. Farmers say they do this to produce food and generate income[86]. Farmers, especially those from the two groups interviewed in Yambio County have a **good sense of planning.** They know how to use their farmland, such as dividing it into land for seed saving, consumption and sale. Groups also open and cultivate large areas of land together that increases motivation and expectations.

Example: Large areas of land cultivated together as a group

The Banguia farmer group opened 24 feddan and the Kada farmer group opened 28 feddan as a group.

In addition, all interviewed group members have access to saving groups for small investments. Groups have visions, plans and know what they would do with generated profits. Groups market or plan to market what they harvest on the group fields as a group and are willing to pay for input and trainings. Two groups are also considering becoming a cooperative or association in the future. Some groups have opened bank accounts and applied for microcredits.

Example: Groups have visions and plans

The Nangume farmer group opened a bank account and applied for a micro credit; therefore they had to register as a group with 25SSP and had to deposit a capital share of 1000SSP. The Green Farmers Microcredit Union has started up a training course in Tumba County and trains farmers on how they should use this money.

However plans and visions often depend on the help of organisations, especially the two groups interviewed in Nzara. On the one hand, the presence of organisations are a reason for high motivation, but on the other hand, they create **high expectations among farmers**[87]. FAO calls this “relief syndrome”[88].

Example: High expectation of farmers

The Nangume farmer group hopes that “World Vision will come from town, buy in bulk and transport it”; the Ringasi farmer group hopes that organisations will purchase directly at the farm gate.

Furthermore, input given by GIZ have not always been distributed according to the farmers’ needs and knowledge. Farmers got some tools (e.g. fork hoe) and seeds (e.g. cauliflower) that they didn’t know how to use or cultivate. At the moment the

[85] Expert interviews with World Vision and RDAA, Yambio County, 09/10/12 and 28/09/12; Focus group discussions, Yambio and Nzara County, October 2012

[86] Focus group discussions, Yambio and Nzara County, October 2012

[87] Focus group discussions, Yambio and Nzara County, October 2012

[88] Expert interview with FAO, Yambio County, 09/10/12

amount of farmers who are supported by GIZ is too large to guarantee good quality services. Those issues might end up lowering the motivation of farmers.

For many farmers, an adult education approach like FFS is new, which again risk to lead to lower motivation when overloading people with information who are not used to education and schools.

The motivation of young people to engage in agriculture is generally very low. FAO quotes

> "...*young guys want to have white-colour jobs, but those jobs are not available, they play cards and don't find what they want, they don't know that you can make money by doing agriculture."*[89]

GIZ DETA can build on existing **organisation and structures of farmer groups**. They have selected positions such as chairperson, secretary and treasurer, conduct regular meetings on how to carry out agriculture, maintain positive group dynamics and plan how to use profits. Group members support each other and work together on the group field. In some groups, teachers are knowledgeable / literate farmers, but this is not always the case. However, knowledge exchange and acquisition are not yet group activities[90].

Generally, **FFS are supported by local authorities**. The local government promotes the primary sector by dealing with agricultural issues and trying to encourage people to be engaged in agriculture. "They try to own it". In addition, the government offers a tax reduction for agricultural activities[91]. In Yambio, the County government seems to strongly support the training of cooperatives. While the study group found 6 registered coops in Morobo County, YAFA alone had 17 member cooperatives[92].

The state government organises a monthly stakeholder exchange at state level for actors involved in food security. Operations of other organisations at state level are known of and coordinated. A coordination platform at County level is not in place. Hence CAD cannot assure the proper coordination of different organisations. Lack of coordination increases the duplication of activities, therefore leading to a result of less ownership and more receiver mentality with unrealistic expectations. Yet, the CAD lacks capacities such as finance and personnel[93].

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[89] Expert interview with FAO, Yambio County, 09/10/12

[90] Focus group discussions, Yambio and Nzara County, October 2012

[91] Expert interview with GIZ DETA, Yambio County, 08/10/12

[92] Expert interview with GIZ DETA, Yambio County, 08/10/12 and focus group discussions, Yambio and Nzara County, October 2012

[93] Expert interview with Nzara and Yambio CAD, Nzara and Yambio County, 06/10/12 and 09/10/12

6.3 Summary for Yambio & Nzara County

Key similarities between the situation in Yambio & Nzara and Morobo County include the following:

Table 18: Key similarities between Yambio & Nzara and Morobo County

Subject	Findings and conclusions
GIZ DETA's target group	GIZ DETA's target group is made up of small-scale farmers with little to no knowledge on modern farming techniques and very low financial capacity but access to sufficient land with high agricultural potential.
Market access potential	Market access is limited due to bad feeder roads, inadequate storage capacities, inaccessible transport services and few local markets. Farmers sell produce mostly on local markets along feeder roads where prices are considerably lower than in city markets in Nzara and Yambio.

Key differences between the situation in Yambio & Nzara and Morobo County include the following:

Table 19: Key differences between Yambio & Nzara and Morobo County

Subject	Findings and conclusions
Repatriation status of target group	Farmers were displaced recently due to LRA activities in some Payams. Not all farmers have returned yet. Some had to build new homesteads in villages far away from their farms due to government safety regulations.
Market access potential	The market access potential for farmers in Yambio & Nzara County appears to be higher than in Morobo County. This is due to better main road conditions, higher ownership of bicycles and that it is seemingly easier to form cooperatives.
Farming as a business	Farmers have a basic sense of planning and more concrete visions for the groups thus should be capable of and willing to learn and implement farm management.
Coordination by the CAD	The MoA of WES and the Yambio and Nzara CAD strongly support agricultural production in the region. At state level the activities of organisations is coordinated under the patronage of the MoA. At county level donor activities are coordinated on paper but cannot be actively monitored by the CAD due to limited resources.
Climate and soils	The climate is characterised by one long rainy season and a dry spell. The agricultural land is characterised by recently opened areas of virgin oxisols.

Key strengths regarding the establishment of FFS in Yambio & Nzara County are the following:

- RDAA is a promising partner for GIZ DETA in the role of master trainer. Potential training sessions for FFS are in place and training sessions in the local language

and for illiterate people are under development. The quality of their training sessions, the demonstration plot and their capacity has to be investigated further.

- A second strength in the region is the strong support of the MoA of WES for agricultural development. Other actors, such as FAO and World Vision, have experiences with implementing FFS in the region. Altogether the FFS approach is welcome in WES and GIZ DETA may be able to draw on experiences of on-site experiences of others.

Weaknesses that need to be overcome for the establishment of FFS in Yambio & Nzara County include:

- Due to recent changes in the project management, GIZ DETA in WES has no clear guidance at this point in time. Also the number of supported farmer groups is too high and the geographic location of some is too remote to be able to ensure high-quality support.
- One major weakness is the lacking stakeholder coordination at county level. Even though the CADs are willing, capabilities are too low. This may result in uncoordinated activities and thus lack of quality of interventions.

One major opportunity for the implementation of FFS in Yambio & Nzara County is the possibility of choosing facilitators from within the communities e.g. knowledgeable farmers since there are no BEW in place like in Morobo County and the PEW are mostly working for other organisations already. Only the Yambio CAD has some CEW that the CAD might want to integrate. Choosing facilitators from within the community can increase ownership of the groups and the prospect of long-term success for the period when GIZ DETA interventions finish.

Another opportunity is that during the establishment of FFS in WES, GIZ DETA can benefit from its experiences in Morobo County or even from the third location Magwi County. The master trainer from Morobo County, AAO, can be a valuable resource and an exchange between all master trainers could be of benefit for all training institutions.

An important threat that needs to be considered in Yambio & Nzara County are unrealistic expectations of farmers for the future that are often based on intense support by organisations. This is partially based on experiences with organisations that bought produce in bulk directly at the farms.

A second important threat is the continuing LRA activities just across the border in Central African Republic and DRC. Even though there are no current LRA activities in the region, some farmers are still afraid of the possibility e.g. when commuting to their farms.

7 Discussion and Recommendations

7.1 Discussion

The following chapter will connect the results and the concepts used in the study with some selected major discussions within scientific discourse.

7.1.1 The FFS Approach in the Fragile Context of South Sudan

As outlined in chapter 1.4, South Sudan is a highly fragile context due to several reasons. The following chapter deals with the performance of FFS in this context. A lot of South Sudan's fragility can be derived from the post-conflict context. Some elements of this context that increase farmer's vulnerability are poor infrastructure and service delivery; as well as a lack of authority, legitimacy and capacity in society-state relations. State building is the strategic framework of the OECD in order to tackle fragility (OECD 2008).

In order to assess the practical viability and concrete realisation of the 10 principles, the OECD is using a specific survey questionnaire (OECD 2011). In this study four principles were chosen and the related questions have been asked to GIZ DETA management staff. The OECD questionnaire mainly focuses on measures at programme level. Other more specific analytical tools for concrete project work on the ground are e.g. Do No Harm analyses, which GIZ DETA already started with a workshop in 2012 and has further plans for in 2013.

The following table on one hand summarises considerations at project level regarding the aid effectiveness of FFS in fragile contexts. On the other hand, it also includes the evaluation of four selected OECD principles at programme level. All information at programme level is gathered from an interview held with GIZ DETA management staff on 14th October 2012. This table does not completely cover the topic but must rather be seen as a gathering of first ideas to launch further discussion.

Table 20: Monitoring of selected OECD principles of GIZ DETA

Selected OECD Principles of Good Engagement in Fragile States (OECD 2007)	Impacts and recommendations concerning GIZ DETA's FFS approach as well as measures at programme level
Take context as the starting point (Principle 1)	**Project level:** GIZ DETA's FFS approach uses local structures to organise FFS and transfer knowledge (local Master Trainer). The concepts of Sustainable Agriculture and LEIA are well adapted to the specific South Sudanese context in terms of agricultural development. **Programme level:** The country strategy does not include an analysis of causes and drivers of conflict, nor a political economy analysis, nor an identification of global drivers of conflict. Nevertheless state building challenges are addressed in component 1 with participative development plans. A regional conflict analysis is available together with a stakeholder mapping and a risk assessment. There are sector-based working groups from different development partners as well as funding for unexpected circumstances, namely scenario planning.
Do no harm (Principle 2)	**Project level:** GIZ DETA's FFS approach does not foster any conflicts in the community so far according to all interviewed FGs. A conflict-sensitive analysis and approach will surely be needed in Magwi County with the background of the Madi - Acholi conflict. A concise Do No Harm analysis of drivers and side-effects or an impact chain has not been elaborated yet but is planned for 2013. **Programme level:** So far GIZ DETA does not coordinate salary levels and recruitment practices with other development partners. There is a monitoring and evaluation of effects of the programming on state building processes. But no institutional mechanism for integrating lessons learned from past monitoring or assessments into strategy and/or programming has been established. GIZ DETA does identify and/ or address trade-offs between its priorities in its country strategy. There is also a process in place to actively manage trade-offs between the country's or GIZ's objectives (e.g. between political, security and development objectives). GIZ DETA does monitor salary developments in South Sudan and does have a policy on the recruitment of staff working for the South Sudanese government.
Focus on state building as the central objective (Principle 3)	**Project level:** GIZ DETA's FFS approach has the potential to build society-state linkages through the organisation and administration of groups that can be addressed by the CAD. The CAD should be more integrated in activities (see recommendations for details). **Programme level:** The country strategy does not include objectives for strengthening political processes and facilitating dialogue between state and non-state actors. Nor has there been an agreement on joint indicators for assessing state building progress with other development partners and/or the partner government. Nevertheless there is a policy for partner government oversight and regulation in partnerships with non-state service providers, including international NGOs. The country strategy includes objectives for strengthening strategic state functions.

Act fast… but stay engaged long enough to give success a chance (Principle 9)	**Project level:** The FFS structure gives a good opportunity to respond to changing conditions on the ground. Emergency food aid can be delivered and knowledge can be transferred through the group. GIZ DETA is also following a LRRD approach that keeps different instruments available for a quick engagement according to the situation. The short time frame of one year funding of ENÜH projects is unfavourable. Since e.g. "capacity development in core institutions will normally require an engagement of at least ten years" (OECD 2007: p.3). **Programme level:** There is no articulated strategy for gradually moving towards aid on budget and through country systems. There is also no policy to stay engaged if relations with the central government were to become difficult. Nevertheless GIZ DETA has rapid response mechanisms and financing types that can be used to flexibly bridge the transition between humanitarian and development assistance. Moreover, humanitarian and service-delivery programming is integrated into a long-term vision emphasising capacity development and state building.

Promotion of Sustainable Agriculture

The promotion of LEIA increases agricultural productivity (output per hectare) and achieves environmental stewardship whilst maintaining the independence of peasant households from input markets controlled by foreign capital (Tripp 2006). It is true that LEIA tends to take longer than conventional agriculture to materialise into financial returns for farmers. In the context of LRRD interventions, however, LEIA practices offer the decisive advantage of reducing the need to bring costly external inputs into poorly accessible remote rural areas. On the one hand this is of advantage in the situation of post-conflict states since road and transport infrastructure is often dilapidated. On the other hand, the promotion of LEIA reduces the risk of small-scale farmers of becoming financially indebted. In using LEIA farmers reduce their need to buy costly external inputs. This reduces the vulnerability of households in the face of fluctuating market prices for external inputs. Propagating LEIA in fragile contexts will become even more attractive in the future as input costs are rising constantly with rising energy costs.

FFS are an ideal approach to promote sustainable agriculture since LEIA practices tend to be more knowledge intensive than associated practices of conventional agriculture. The fact that FFS build on farmers existing knowledge through practical experience, rather than by theoretical prescription, makes it possible to test out knowledge-intensive agronomic practices.

Focus Initial Interventions on Achieving Quick Impacts

Interventions that show quick impacts in terms of improving farmers living conditions increase farmers' motivation. In the context of LRRD projects, FFS must focus on

interventions that achieve quick impacts, before focusing farmers attention to more long-term goals[94]. Otherwise there is a risk of losing farmers' interest and participation.

Example: Quick impacts increase motivation

FFS promoting off-season vegetable production will be more successful than FFS promoting green manures, since the time to see economic returns is immediate for the first, while it takes 2-3 years for the latter to recognise marked impacts in productivity that are also reflected in economic cash returns.

Based on the above experience, FFS interventions in fragile contexts find themselves in conflicting positions towards other programmes that support a more "hand-outs" based approach (GIZ no date). Similarly, FFS based on conventional agriculture will be more attractive than FFS based on LEIA principles since immediate benefits are expected by the target audience. But FFS group meetings and a forward-thinking FFS training course present a real chance to stir reflection among the target group on long-term impacts of technological choices for livelihood resilience.

Plan Intervention Portfolios that Assure Efficiency of Extension

The impacts of FFS must generate sufficient income for farmers at the time a project ends, so that farmers can pay the running costs to uphold the provisioned FFS service system. Intervention portfolios must therefore be planned to ensure the efficiency of extension. If the costs of running the FFS system with all the required inputs, equipment, and training exceeds the capacity of farmers to pay for it from their financial returns, then that FFS system cannot be sustained. Farmers will discontinue with their FFS groups once external subsidies are removed.

Long-term Engagement to Create a Sustainable Service System for FFS

Long-term engagement is necessary to create a multi-actor service system. FFS require a service system that includes a master trainer, facilitators, agricultural input providers, market information brokers, mechanical servicemen, and credit services. (Sustainet 2010). FFS can only endure if all required service providers are capacitated to continue their activities when development assistance has moved out[95].

Creating a functioning multi-actor service system is a long-term task, which clashes with the short-term funding cycles (of 1-3 years) that are typical for LRRD projects.

[94] Expert interview with Biovision, Nairobi (Kenya), 30/10/2012

[95] Expert interview with Biovision, Nairobi (Kenya), 30/10/2012

That is why some would argue that integrated approaches of development assistance[96] would be ideal to build up a sustainable FFS Service System[97]. However FFS within LRRD projects are a good starting point to link rehabilitation with long-term development. If started as LRRD projects, FFS require a hand-over strategy that clearly outlines how all the relevant service providers are linked to follow-up projects in an ensuing phase of technical development cooperation.

7.1.2 FFS' Influence on Farmers' Resilience

Increase of Buffer Capacity

The project seeks to improve diversified crop production in order to cope with shocks and to minimise dependency from one or a very limited number of crops that may have high risk, such as price fluctuation. Furthermore the approach implemented by GIZ DETA is seeking to comply with criteria of sustainable agriculture, which assures the positive net return out of existing resources also in the future. Those factors will have a maintaining effect on soil quality, which ensures a good harvest and higher drought and flood resistance. These two aspects are assessed very positively and are increasing the buffer capacity of farmers in Morobo County.

Disaster Risk Reduction and Climate Change Adaptation

The prospect of climate change is one example where risk management plays a role in agriculture. Some of the LEIA practices that are already promoted as part of the current FFS trainings are part of the new concept of "climate smart agriculture"[98]. This concept seeks to protect ecosystem services upon which stable agricultural production depends. FFS can teach these practices more explicitly from an angle of disaster preparation and risk reduction to increase farmers' awareness about long-term impacts on their livelihoods that result from wise technological choices with a focus beyond immediate profit margins. An example would be to link training modules on agroforestry and conservation agriculture with training modules on the need to protect watersheds for flood control, and drought reduction.

Nevertheless, the term of "risk management" has not been included in GIZ DETA's FFS approach yet. There is no training module on Disaster Risk Reduction (DRR) [99]. Knowledge on risk and applying basics of risk management helps farmers to increase their buffer capacity and reduce vulnerability to future shocks.

[96] such as "Local and Regional Economic Development" (LRED)
[97] Expert interview with GIZ FSAD, Yei County, August 2012
[98] http://www.climatesmartagriculture.org/en/ (accessed: 14/11/12)

The project approach builds on training and increasing the knowledge of small-scale farmers. This is important to actively cope with possible shocks and is assessed very positively.

Overall, the FFS is a good approach to increase buffer capacity and to actively cope with shocks.

Increase of Organisational Capacity

A higher degree of organisation is targeted by establishing and working with groups instead of individual farmers, which means farmers participate in stakeholder groups. The project has conducted group dynamics training to establish group structures and make them work properly. Farmer groups have the aim of producing and marketing together as well as being one unit, which increases social capital, such as trust between people. As a result, the organisational capacity of farmers has been increased. Nevertheless, in some groups the social connection is still too low. In the long-run, a community-based approach could step into place.

Community-Based Approach (CBA)

In a CBA the entire community is involved in the decision on who should participate in FFS, how to design activities, the choice of facilitators, how to cultivate the plot or going even further, it leaves the whole design of FFS to the community itself (World Bank 1995, Merchant 2010). A CBA has the potential to strengthen civil society and democratic structures, which is especially valuable in the given context. Besides strengthening the organisational skills of participants, it promotes ownership for the group, one of the success factors for the long-term sustainability of the FFS. Other benefits include a stronger focus on the needs and interests of the beneficiaries and capacity building of the people involved in the process.

CBA are not free of criticism though (World Bank 2003, Merchant 2010) and need careful consideration and planning. Apparent limitations include those linked to the capacities of GIZ DETA staff in terms of number and experience with participatory methods. Another project-related limitation is the time consuming procurement processes, which may narrow down the freedom of choice for crops. Major limitations from the beneficiaries are low knowledge, leadership and skills amongst farmers, which are a prerequisite for the successful organisation of the process. Finally in the current fragile context, a CBA must not exclude the local government i.e. the CAD, which is an important partner.

Organisational capacity also means keeping a balance between autonomy and links to other institutions, such as banks, trader, and suppliers. This means that on the one hand it is favourable to strengthen groups and its autonomy, so that they do not depend on other actors. On the other hand, some level of relation and collaboration is crucial for the functioning of groups. Both aspects are still far from being reached and

hard to assess due to the missing long-term strategy. What is possible to say is, that the FFS groups have the potential to achieve those aims in the long-term.

Overall, organisational capacity is still low. The study team concludes that observed organisational capacity does not fully enable farmers groups to be strong enough to adapt their strategies on changing conditions, **but the FFS is a very good approach to target this aim.**

Increase of Adaptive Capacity

It is positive that farmers supported by GIZ DETA receive extension services through the FFS, which increases their adaptive capacity. The knowledge they acquire on improved agricultural practices and post-harvest handling facilitates the process of adapting to challenging situations, such as less rainfall, pests or changing market prices. In addition, GIZ DETA is generally informed about the needs and abilities of farmers through the conducted needs assessment, which makes it possible to provide extension services accordingly to their needs. This is a factor that positively influences adaptive capacity. Another criterion is the access to different types of knowledge and information, which can hardly be observed within the current situation of most of the farmers in Morobo County. The only institutionalised type of knowledge-sharing the farmers are able to access is provided through the FFS.

Adaptive capacity is also influenced, firstly by the level of participation and secondly by motivation. A certain level of participation is given within the FFS approach and to some extent may be suitable for the current situation and defined target group.

Strengthening farmers' self-learning ability increases their adaptive capacity

Field days and exchange visits can be used as methodological tools in FFS to raise farmers' awareness of local information brokers. FFS groups can be taken to agricultural research centres, cooperatives and the demonstration farms of master trainers in close vicinity to FFS sites. Exchange visits can also be organised between FFS groups that experiment with specific technologies. Exchanges of this kind can spark the curiosity of farmers to seek the latest agronomic and market relevant information by themselves. Farmers who actively- seek information on their own are better equipped for coping with changing conditions that affect their farming system.

Motivation increases the capacity of adaptation in terms of individuals or groups who seek self-learning and adaptation to adverse effects through their own trials and experimentation. This aspect is tackled by the FFS by making use of a FFS field and growing different crops on it every season. However, it has the potential to move slowly from demonstration to more experimentation and PTD over the longer term, where farmers have the ability to carry out self-learning.

The team has gathered from above that the **FFS is a very good approach to increase adaptive capacity, because that is the core aim of the FFS.**

7.1.3 FFS and Food Security

By supporting the establishment of FFS, GIZ DETA aims to achieve local food security on the micro level as well as on some areas of meso level, in terms of the administrative dimensions, as described in the conceptual part of the study (InWent 2009). Food security shall be achieved by increasing agricultural productivity and generating income through the sale of important food crops. Given that it is still the early stage of the pilot phase, it is not yet possible to provide information on the actual impact of the FFS on people's nutrition.

However, the sustainable intensification of production and marketing on village (Boma), district (Payam) and partially province markets are targeted. Distant markets, especially in other states are not aimed at due to:

- Most farmers are not able to produce large quantities (small cultivation size, limited production factors and limited capacities)
- Poor private sector, almost no processing and only a few traders (poor infrastructure)
- Technical knowledge along the whole value chain is lacking
- Competition on urban markets by cheap imports from Uganda (after the war South Sudan lost its competitiveness; in the course of the CPA, markets have been liberalised, which means that import tariffs were removed)

Advantages and Disadvantages of Cheap Imports from Uganda

Advantages: consumer surplus increases due to lower prices of products; the general welfare of the national economy increases; consumers profit due to improved varieties, e.g. tomatoes, oranges; Imports can compensate for low production so that demand can be met; Imports can help in the lean period

Disadvantages: producer surplus decreases; producers cannot compete with the imports due to fewer and more expensive production factors that increase production costs; lean period in the study region could be covered with locally produced food: small-scale improvement, such as improved storage, might be sufficient; strengthening the national food sovereignty should be the aim; when buying imported goods, farmers need to look for income sources other than agriculture

Nevertheless, the potential for contributing to a regional and also national food security exists due to a large agricultural potential in the Greenbelt region that has not been exhausted yet. Even 70% of total land in South Sudan is suitable for crop production and only 4% is being used (Fews.net 2009, FAO 2012). A first step is the co-

operation with WFP P4P, which is going to buy and store produce from FFS. This would link farmers to the market more and give WfP the possibility to look into supplying deficiency regions in South Sudan.

The FFS is a viable approach to achieve local and regional food security, but further action is needed first, such as the improvement of post-harvest handling, support of soft mechanisation and improving the market access. Please see the detailed list of recommendations.

7.2 Recommendations

The main recommendations were selected from the complete list of conclusions and recommendations below each set. Selection criteria included the time horizon for implementation (short and medium-term), feasibility by GIZ DETA as well as the importance of the conclusion or expectation of improvement.

7.2.1 Recommendations for all locations

Main recommendations for Morobo, Magwi, and Yambio & Nzara County

- **Support soft mechanisation** to increase agricultural productivity by providing tools and training for hand-held mechanisation (e.g. ox-plough, one wheel tractor, hand planting machines).
- **Promote improved post-harvest handling.** Promote better drying facilities for produce and improved individual storage facilities to strengthen the food security situation at a household level.
- **Include basic training on agribusiness and farm management in the FFS ToT** to strengthen farmers' market-oriented planning capacities.
- **Provide training and financial help to build group storage facilities** that have the capacity to link FFS to WFP warehouses or to attract wholesale buyers to communities along feeder roads.
- **Diversify extension methods** to strengthen the self-learning capacity of farmers, such as field days and exchange visits to information brokers. Disseminate agricultural information via radio programmes. Support the CAD by providing training materials. Additionally build knowledge and capacities within FFS groups on where to acquire information. Provide appropriate extension material through manuals, hand-outs, posters that are also appropriate for illiterate people.
- **Strengthen the CAD** to build up relevant government structures and to guarantee long-term support and guidance for farmers and FFS.
- **Improve farmers' market access.** Look into possibilities of supporting small market stalls on local markets. Strengthen the cooperation with FSAD.

- **Further strengthen groups** by (a) training 1-2 people in the group to act as lead farmers, (b) promoting communal labouring within the groups, (c) introducing a self-financing system of training sessions and other services provided to ensure long-term success.
- **Improve financial capacity of farmers** by (a) helping FFS groups to develop concrete business plans for farm-related income, thereby putting into practice the visions of participants, (b) setting up revolving funds that enable farmers to make productive farm investments or kick start IGAs, (c) supporting cash for work to rehabilitate feeder roads, (d) combining cash for work with training on the establishment of saving groups.

Table 21: Conclusions and recommendations for all locations

Conclusions	Recommendations
Content of FFS	
Farmers' productivity is limited due to low labour productivity.	**Support soft mechanisation** to increase agricultural productivity by providing tools and training for hand-held mechanisation (e.g. ox-plough, one wheel tractor, hand planting machines).
Farmers practice extensive agriculture. The low degree of intensification is a problem for the long-term sustainability of current farming practices. Once human population density increases in the Greenbelt of South Sudan, current agricultural practices may severely fragment the natural resource base. In the short term more than 70% of farmers in Morobo County do not yet have the ability to produce a regular surplus that is large enough to reach high value markets.	**Support sustainable intensification.** Intensify / Provide training on improved fallows using green manures, on agro forestry, on mixed cropping and crop rotation, on appropriate irrigation for dry season vegetable production, as well as on IPM.
Post-harvest handling is the subject of FFS, yet is still a major problem of farmers. Farmers lose large proportions of their produce due to post-harvest losses. Reasons include poor drying and storage facilities. The food security situation is worse during the lean period months. A main reason is the lack of improved individual storage facilities.	**Promote improved post-harvest handling.** Promote better drying facilities for produce and improved individual storage to strengthen the food security situation at household level.

Farmers have limited knowledge on farm management and marketing.	**Include basic training on agribusiness and farm management** in the FFS ToT to strengthen the market-oriented planning capacities of farmers. Train farmers on collective business planning, including the sequential planting and harvesting of perishable crops, collective storage, collective transport and sale. Train farmers to document experiments and observations within the FFS group to use it to further the learning process.
An initial training session in Morobo on "farming as a business" was misconceived by farmers and facilitators alike to mean that mono-cropping high potential crops was advised to achieve market access.	Provide a training module on crop diversification to farmers which explains how food crop diversification can strengthen food security and how cash crop diversification can buffer against price fluctuations on the market.
High potential for income-generating crops has not yet been exhausted in terms of tree products (fruits, timber, and wood fuel), coffee, sesame, and vegetables.	Introduce income-generating produce like tree products (fruits, timber, and wood fuel) and special crops like coffee, sesame, and vegetables into training.
Prices for vegetables are high during the dry season when few farmers can grow them locally. At the same time means of transportation are limited and inadequate for vegetable transportation.	**Promote dry season vegetable farming for selected groups.** Look carefully into the following issues: accessibility of water source and potential for transportation. If proper transportation cannot be provided consider additional training on small scale transformation such as drying.
Farmers have limited marketing capacities to reach high value markets at present since most of them only sell their individual produce to the local market. Furthermore farmers market their individual yields as individuals. Finally traders and wholesalers are not attracted to villages along the feeder roads due to small farm gate quantities available at present.	Provide training and financial help to build **community group storage facilities** that have the capacity to link FFS to warehouses of WFP or to attract wholesale buyers. Bulk storage facilities at central locations could link farmers to high value markets by attracting wholesale traders.
Data on soil types is scarce and mostly only available through general secondary literature. Local researchers only recently started working on the issue[100]	**Conduct soil analyses.** Cooperate with local partners such as the Yei Agricultural Research Centre or researchers carrying out soil analyses.

[100] Expert interview with Mr. Anthony Tabia Tukabe, Yei Agricultural Research Centre, 16.10.2012

Diversify Extension Methods	
Facilitators' teaching skills are important to deliver the content of ToT. Knowledge alone is not sufficient here.	**Intensify training on didactic methods** like participatory methods, elaborate on teaching skills, especially for dealing with illiterate people.
Farmers are left alone with regards to acquiring information, both in terms of latest agronomic knowledge and market information. By using the current extension methods, the self-learning capacity of farmers is promoted in a minor way.	**Diversify extension methods** like field days, exchange visits to information brokers (e.g. take FFS groups to master trainer, local research institutions, to cooperatives, to agro dealers, to seed fairs, etc). Disseminate agricultural information via radio programmes (e.g. refer to farmradio.org). Here GIZ agricultural staff or AAO could be responsible. Support the CAD through training materials to fulfil its role as an information broker. Build knowledge and capacities within FFS groups to acquire information. E.g. one person out of the group becomes an information broker. Use participatory methods: own trials and experiments, PTD and AESA for long-term
There is almost no extension material that facilitates transmission of messages/content to facilitators and farmers.	**Provide appropriate extension material** through manuals, hand-outs, posters that are also appropriate for illiterate people.
Long-Term Success	
Exit Strategy	
There is no exit-strategy for GIZ DETA's intervention and the FFS activities yet. The take-over of services provided by GIZ DETA by local stakeholders in the future has not yet been planned.	**Develop an exit-strategy** based on the road map given in this study.
Cooperation with local structures	
At the moment CAD is not fully involved in the implementation of FFS. With CAD as the relevant state institution to support agricultural development in the county, it has limited means and capacities. A long-term vision of the FFS in order to ensure long-term success is missing.	**Strengthen CAD** to build up relevant government structure and to guarantee long-term support / accompany farmers and FFS **Integrate the CAD in the FFS approach**. Invite them to strategy discussions. Take the CAD staff to field trips. Integrate the CAD staff in trainings.
A regular exchange with other donor organisations in the region is necessary for proper donor coordination to ensure the alignment of intervention approaches with County strategies and to prevent duplicate support for farmer groups, especially if new donors become active in the region.	Advocate the CAD with establishing a **monthly stakeholder meeting** with all donors and other organisations (such as cooperatives) active in the agricultural sector. Support CAD with capacity development and fund accordingly.

Farmers have limited access to markets. The main bottleneck is bad road conditions. Furthermore farmers have limited means to transport their surplus produce to regional and urban markets and limited processing capacities.	**Improve market access.** Look into possibilities of supporting small market stalls on local markets. Look into the possibility of cooperating with FSAD.
Land ownership is mainly based on traditional land rights. The official registration of land rights seems to be possible in Yambio County.	**Investigate the land right situation carefully** and promote the official registration of land titles if possible.
Further strengthen groups	
Certain people in the group who act as drivers are important to give the group a vision and have the potential to act as lead farmers. This creates a feeling of ownership.	**Strengthen the position of lead farmers.** Let the groups define a vision for the future. Meet with the groups to define a timetable and financing models. Lead farmers must guide these processes. Include this element in the ToT and let lead farmers participate in ToT from the beginning.
Communal labour system increases motivation to open and cultivate bigger pieces of land. Team farming strengthens group dynamics.	**Promote communal labour systems** in groups. Therefore train facilitators and/or lead farmers to take the lead in this system[101].
There is no contribution system that generates any kind of payment for given services.	**Establish a group contribution system** to ensure continuous training even in the long-term. Money can be used to pay lead farmers, buy seeds together or to make a joint investment. Discuss with the groups if they are willing to pay a small amount of money to the lead farmer for training and supervision[102].
The level of participation is rather low within the applied FFS approach. Although this fits to the specific situation and low level of agricultural education to a certain extent, an increase in participation positively influences motivation and ownership of farmers.	**Make a more participative approach of the FFS** within GIZ DETA's limits of finance and procurement procedures. For example, include farmers in the planning processes as described in the approach of Participatory Integrated Community Development (PICD)[103].
The level of participation and motivation increases the adaptive capacity and ability of self-learning.	**Increase identification with the group** through: songs, logos, slogans or by handing out certificates.

[101] A communal labour system looks roughly like this: Find 7-15 people who are willing to work together on each other's farms. Let them agree on the size of land that should be worked on. This needs to be the same size in each and every field. Agree on payment or reward.

[102] e.g. 2 SSP per meeting. For a group of 20 people that meets 2 times a week, this would make 320 SSP

[103] PICD enables the whole community to actively participate in the planning process by contributing their own ideas. Peoples' skills, knowledge and local experience can be applied. In return a much stronger ownership feeling of the community could be expected.

Improve Financial Capacity of Farmers	
Farmers have little to no capital for productive farm investments. The access of capital and a small stock of savings would increase the farmer's buffer capacity.	**Improve financial capacity of farmers** by (a) helping FFS groups to develop concrete business plans for farm-related income generating visions mentioned by participants, (b) setting up revolving funds that enable farmers to make productive farm investments / kick start IGAs (c) supporting cash for work to rehabilitate feeder roads (d) combine cash for work with training on the establishment of saving groups
Exchange of the three locations	
The establishment of FFS in Magwi and Yambio & Nzara County can benefit from experiences and the know-how of the staff and project partners in Morobo County. At the same time Morobo County can get new impulses from Magwi and Yambio & Nzara County.	**Establish an exchange of the three locations.** E.g. send staff from one location to join other locations for a limited period of time (e.g. two weeks).
(Potential) Master trainers have know-how on different training modules and material, e.g. AAO is experienced with GIZ DETA's FFS approach, RDAA has training sessions on Farming as a Business and are developing training material for illiterate people.	Establish an exchange of (potential) master trainers for synergy effects e.g. for collective development of training material.
Monitoring and Evaluation System	
The evaluation of ToT, facilitators and implementation at farmer level is a management task of the responsible support structure i.e. GIZ DETA (link to literature). An evaluation in addition to the crop yield assessment e.g. is necessary to ensure the quality of interventions.	**Implement a GIZ DETA-based monitoring system** for the ToT, performance of facilitators, farmer groups and implementation/outcome of project activities.
Timely procurement, project planning, ground working activities are crucial for the success of FFS; threat: expectations of farmers may not be met, thus motivation / satisfaction of farmers may decrease	**Ensure timely procurement and planning** of GIZ DETA's FFS activities. If seeds arrive late inform farmers timely. If seeds cannot be distributed on time rather store them and distribute at a later point as to avoid unnecessary work and frustration of farmers. Start ground working activities on time.

7.2.2 Recommendations for Morobo County

Main recommendations for Morobo County

- Keep in mind that the ToT of the FFS relies on one organisation, namely AAO. **Force cooperation with potential knowledge providers** to ensure a continuous

knowledge supply even if AAO is not available, e.g. CTC Yei. At the same time, support AAO to increase their capacity in terms of additional staff.

- **Use lead farmers as facilitators.** When scaling-up the FFS approach in Morobo County, appoint experienced BEW as facilitators for new FFS groups. Lead farmers should take over the role of BEW in pre-established FFS groups. Lead farmers of new groups should participate in ToT from the beginning.

Table 22: Conclusions and recommendations for Morobo County

Conclusions	Recommendations
Assessment Criteria	
Content of FFS	
Capacities and empowerment of women is low. Experiences show that in a context in which women were not used to speaking out freely, female project staff or facilitators can serve as better contact for women; it is necessary to strengthen women's capacities and motivation to openly participate in discussions	Further **strengthen the capacities of women** by: Inclusion of female facilitators: Employment of female staff e.g. female mobilisers or female FFS supervisors Focus on training needs / didactic methods for women to further strengthen women's participation
Certain modules are hard to understand for facilitators and farmers, especially pest and disease management and seed savings. The BEW need more time to assimilate the content of the ToT	**Offer intensified ToT sessions,** which take at least two days per module. Conduct refreshment sessions at least for the next season and guarantee regular follow ups ("training on the job") in the field, which could be done by AAO staff.
The motivation problem seems to be more a general problem for people with less knowledge who become frustrated and lose interest/were never interested in agriculture. Many of them do not know that agriculture has a large potential to generate income.	**Strengthen the youth** (long-term goal): cooperate with/lobby at schools for the establishment of school gardens Discuss possibilities and feasibilities for establishing a pilot JFFS Junior Farmer Field Schools (JFFS)
Long-Term Success	
Cooperation with local structures	
No exchange with MoA concerning alignment of agricultural policies in place. GIZ DETA does not report on activities.	**Establish a relation with the MoA** of CES in Juba concerning agricultural strategies and donor coordination to ensure the proper, long-term alignment of government policies and intervention strategies.
For the ToT, GIZ DETA relies completely on AAO, but their capacities may be limited in the future due to other engagements.	Keep in mind that the FFS relies on one organisation. Support AAO to increase its number of staff. **Force cooperation with potential knowledge providers** to ensure a continuous knowledge supply in form of ToT even if AAO is not available, e.g. CTC Yei.

Update of agricultural knowledge of the master trainer is mainly based on the internet.	Establish a possibility to **update the agricultural knowledge of the master trainer** and GIZ DETA staff e.g. further training at universities, exchange with other knowledge providers (such as RDAA, FAO Magwi / Yambio & Nzara County)
The number of BEW is not inexhaustible. Almost every group has one to two very active characters that are able to act as lead farmers. These constitute cost-effective facilitators and can create a feeling of ownership within the group. Farmer to farmer extension is only at the initial stage.	**Use lead farmers as facilitators.** When scaling-up the FFS approach in Morobo County, appoint experienced BEW as facilitators for new FFS groups. Lead farmers should take over the role of BEW in established FFS groups. Lead farmers of new groups should participate in ToT from the beginning. Offer two different types of ToTs, one basic ToT for beginner groups, based on a needs assessment and one advanced ToT for graduate lead farmers after evaluation at the end of a FFS season. This will lead to the goal of farmer to farmer extension. GIZ DETA and BEW can act as facilitators and take over supervision.

7.2.3 Recommendations for Magwi County

Main Recommendations for Magwi County

- **Select the facilitators from the community** as part of the GWA, by using the model practiced by SNV in Magwi County.
- **Use a conflict-sensitive approach concerning the Madi Acholi situation** with regard to Do No Harm. Ensure equal distribution of staff, input and facilitators for Acholli and Madi and check whether the ethnicity of the master trainer could cause tensions.
- **Communicate clearly from the beginning what FFS can provide and what it cannot** to avoid disappointment based on unrealistic expectations.
- **Aid the FFS groups to develop concrete business plans for visions of farm-related IGAs** that are mentioned by the community. Filter out the most promising business plans and provide financial support to FFS groups to put them into practice.

Table 23: Conclusions and recommendations for Magwi County

Conclusions	Recommendations
Establishment Criteria	
Ground Working Activities	
An operational plan for ground working activities is still missing.	**Create an operational plan for GWA** with tasks, responsibilities, staff needed and materials. The road map for GWA provided by the study can be used as a basis. Exchange staff from Morobo for knowledge exchange.
There is no master trainer. The Yei Crop Training Centre cannot substitute a master trainer.	**Find a master trainer / outreach model / contact Sworo Yepes from FAO.** Consider an outreach model where a master trainer from Torrit, Juba, etc. comes for regular training. This would also bypass the problem of the ethnicity of the master trainer with regards to the Madi / Acholi conflict. Get in contact with Sworo Yepes, a master trainer from FAO in order to find out whether he knows a potential master trainer or if he himself would be available.
There is a lack of suitable facilitators. No BEW are available in Magwi County.	**Find adequate facilitators.** Select the facilitator from the community. Apply the SNV method of training, screening, selecting (see above) in order to find suitable facilitators[104]
Avoid Conflict	
In 2011 there were violent clashes between the Madi and Acholi people in Magwi County. The FFS approach is not conflict-sensitive yet with regards to supporting Madi and Acholi in order to avoid further harm.	**Ensure equal coverage** of staff, input, and facilitators. Check if the ethnicity of the master trainer could cause tensions. Also evaluate the conflict potential which the introduction of specific technologies could unfold in the area. An example: Ox-ploughs would be suitable for introduction in the Madi corridor since land is less bushy and characterised by sandy soil. Land opening in the Acholli corridor would ideally require mechanisation with tractors by contrast.
In order to avoid conflicts and support cooperation with the FFS, the relevant stakeholders must be met.	Meet with FARM project, FAO, CAD and SNV in order to **clarify the different FFS** approaches and to avoid harmful business competition. **Distribute tasks.** Forge an alliance where different stakeholders of the region are responsible for different

[104] SNV model of choosing facilitators: SNV allows the community to appoint three potential facilitators. SNV then trains all of these three potential facilitators, choosing one of them to implement their project measures.

	services (e.g. FAO for training of facilitators, SNV for training on income generating activities, WFP for storage network, CAD for stakeholder meetings, etc.). **Create synergy effects.** Meet with CAD, SNV, WFP and FAO in order to find out possible synergy effects. E.g. common master training, exchange of facilitators, exchange of content, methods, common ground working activities, discuss sites for storages, etc. Forge an alliance.
Content of FFS	
Training of farmers on collective business planning does not happen. Overall, the market access situation is better than in Morobo County due to the Juba-Nimule tarmac road. This road links farmers to high-value markets like: Juba, Nimule, Torit, Kit, Owiny, Amee Junction, Kerepi, Pageri, etc Awareness of farming as a business is present among most farmers in Magwi and Pageri due to the time spent during exile in Uganda. Farmers have seen that agriculture can be a business and want to copy what they have seen in Uganda Farmers sell and market their individual yield as individuals at the moment. They only bulk produce from commercial group plots so far.	**Include basic training on agribusiness and farm management** in the ToT of FFS right from the beginning. Training on collective business planning, sequential planting and harvesting of perishable crops, on collective storage, transport and sale could help the farmers to discover new market channels.
Most Important Staple Crops	
Cassava is the most important staple crop during the hunger season (June- July) when farmers' food stores run empty. It provides families who have little money to buy food during the lean season with essential calories: Maize, cassava, and sorghum are the most important food crops for the local farmers. All three of them are also used as major cash crops. The advantage of cassava over maize and sorghum is that you there is no need to store it in an external storage. When it is ripe farmers can leave it in the soil to harvest it throughout the year when needed for consumption. Tubers like cassava are performing better in sandy soils than in loamy soils. Thus, the Madi Corridor would be better suited than the Acholi Corridor for cassava-up scaling activities.	For initial agronomic training, **place a stronger emphasis on tuber staple crops**, especially on sweet potatoes and cassava to strengthen household food availability during the dry season (January to March) and lean season (June to July). Introduce improved varieties of cassava that only take 1 year to mature and can be stored well even outside the soil. Introduce improved varieties of sweet potato as a dry season staple crop. It is a popular tuber among the Madi and Acholi. Several NGOs including "Catholic Relief Service" (CRS) and "Farm Africa" were active in Magwi County in up scaling cassava production to strengthen food security among local farmers. CRS is no longer running these projects. Farm Project has interrupted its operations. GIZ DETA could fill this service gap.

Increase Farmers' Productivity	
Limited potential for dry season vegetable production at exclusive permanent wetland sites since only 5/40 farmer groups currently supported by GIZ DETA have access to permanent water points for dry season vegetable production.	**Use montane valleys, rivers and floodplains for dry season vegetable production**. If GIZ DETA wants to promote dry season vegetable production through FFS, new groups would need to be established for that purpose
Best sites identified for dry season vegetable production are 1) the floodplains of the White Nile 2) along Ayii river, Atepi river, Aswa river.	Promote dry season vegetable production along the floodplains of the White Nile and along the local streams of Ayii river, Atepi river, Aswa river.
Long-term success	
Farmers often have high expectations when getting support from organisations. Those expectations seem unrealistic and not good for the long-term success of the group.	**Communicate clearly** from the beginning what FFS can provide and what not to avoid. Disappointment based on unrealistic expectations.
Improve Financial Capacity of Farmers	
Many farmers groups in Magwi and Pageri have concrete income-generating visions: Farmers have the vision of rearing small livestock as an income-generating activity. Others want to establish a grinding mill in under-serviced villages as IGA for their farmers group. Others want to become marketing cooperatives buying and bulking produce from neighbours before transporting it to high value markets.	**Assess community-based visions of farm-related IGAs** for economic feasibility. Aid the FFS groups to develop concrete business plans for visions of IGAs that are mentioned by the community. Filter out the most promising business plans and provide financial support to the FFS groups to put them into practice. As part of an exit strategy, **set up revolving funds** that are based on biological resources. Train farmers to manage these resources as a sustainable income source. Such IGAs could take the form of a poultry business, a goat-rearing business, beekeeping and honey production, etc. Support farm-related IGAs such as metal works, tractor repair services, and mechanical workshops.

7.2.4 Recommendations for Yambio & Nzara County

Main Recommendations for Yambio & Nzara County

- **Select facilitators from the community** as part of the GWA, by using the model practiced by SNV in Magwi County.
- **Clarify where to place the FFS field**, because repatriation has not yet been completed. Distances between homesteads and farms can be up to 7 miles. Check with the government concerning existing settling regulations and check with

farmers to see whether they are planning to return to their farm and thus where they would like to place the FFS field.

- **Communicate clearly from the beginning what FFS can provide and what it cannot** to avoid disappointment based on unrealistic expectations.

Table 24: Conclusions and recommendations for Yambio & Nzara County

Conclusions	Recommendations
Establishment Criteria	
Ground working Activities	
An operational plan for ground working activities has not yet been developed.	**Create an operational plan for GWA** with tasks, responsibilities, staff needed and materials**. Exchange staff** from Morobo for knowledge exchange.
RDAA are promising partners and a potential candidate for a master trainer (good technical knowledge and previous experiences with FFS in Kenya).	**Contact and discuss with RDAA.** Investigate which trainings they can supply now. Involve in the process as soon as possible. Discuss possible design and content of FFS and link them with AAO. Further "research" concerning demo farm is needed.
Ragozere Agriculture Training Centre: Training capacities are low, graduates are potential candidates for facilitators	**Check** if individual graduates are potential **candidates for FFS facilitators** (e.g. if they come from the community); give them some additional training, further investigate CTC concerning suitability for being a master trainer.
High number of groups and farmers supported in total, some have been trained only to be able to receive input – quality of support is suffering	**Choose a reasonable number of committed groups** (groups with long-term visions) to be supported to ensure quality
Return process has not yet been completed. Distance between homestead and farm can be up to 7 miles.	**Clarify where to place the FFS fields.** Check with the government concerning the regulations. Check with farmers if they are planning to go back to their farm and where they would like to place the FFS field
There is the potential to select farmers directly from the community or group. In some groups, knowledgeable farmers are available. CAD lacks quantity and quality in staff. World Vision and FAO find facilitators in the community/group which works very well	**Select the facilitators from the community.** Here the SNV model from Magwi County can be practiced. This needs to be part of the GWA.
Worldvision and FAO have valuable experience that GIZ DETA can draw on	Envisage cooperation in form of exchange of experiences.
Content of FFS	
High potential for fruit and fruit trees, also for cash crops: oil palm, sugar cane, coffee	**Include fruit trees from the beginning** (grafted varieties that have a potential for sale); it only takes a few years until farmers can expect profit from it.

	Include oil palm, sugar cane, coffee in the content only in the long-term, since it will be long until farmers can expect profit from it.
Micro credits may become available for farmer groups in the near future; but farmers do not yet have skills on how to apply for and manage them.	**Support applications for micro credits.** Cooperate with institutions that supply micro credits. Develop training for ToT. Only provide support to groups after examining whether they are suitable.
Farmers face natural risks to some extent / may face it in the future	Include the basics of risk awareness and risk management in the content of the FFS. Build boreholes to guarantee safe access to drinking water wherever possible.
The few groups that have access to a water source have potential for dry season vegetable production	Distribute treadle pumps and **include dry season vegetable production issues** for interested groups that have access to water sources.
The motivation of young people to engage in agriculture is generally very low	**Introduce Junior Farmer Field Schools** (JFFS) as a pilot and cooperate with schools to implement school gardens, MoE highly supports it.
It seems to be easier to form cooperatives (at least in Yambio County)	Talk to the department of cooperatives, find out conditions for registration. **Support the establishment of cooperatives** within the FFS in the long-term if it proves to be realistic.
Long-term success	
Farmers often have high expectations when getting support due to the high number of operating organisations. Those expectations seem unrealistic and are not good for the long-term success of the group.	**Communicate clearly** from the beginning what FFS can provide and what it cannot to avoid disappointment based on unrealistic expectations.
Ensure Continuous Support from GIZ Management	
Coordination with management is not sufficient to sustain the motivation of the staff.	**Clarify management / project goals** etc. jointly (management and team) in the near future. Make management tangible for the team. Make budget more transparent for staff to guarantee the ownership for the project. Provide training sessions for interested staff.
There is insufficient agricultural staff to sustainably implement a reasonable number (15-20) of FFS groups. The available staff has no or very little experience with FFS.	Hire third-party staff, if possible with knowledge on FFS or move 1 member of staff from Morobo to WES.
Improve Market Access	
Warehouses in Nzara are a big opportunity for the County.	Support NAFA in developing a strategy on how to **link farmers with the warehouses** and quality management; GIZ DETA should train farmers accordingly; look into the pos-

	sibility of working in cooperation with other organisations concerning the linkage of warehouses-traders and quality management
YAFA and NAFA are potential partners for FFS groups	**Look into possibilities for cooperation with NAFA and YAFA**, such as using their facilities for assuring market access for farmer groups, e.g. storage or transport.

7.3 Strategy Discussion

The aim of the last chapter is to outline strategic ledgers for future development which exceed the LRRD time frame. In order to create an deliverable strategy, a concise planning process is needed. Classical strategy development steps shall be adapted and applied to GIZ in South Sudan (Kaplan et al 2008). Due to limited resources this process cannot be performed completely but the following shall outline some key factors for further planning.

What areas do GIZ DETA work on and why? Concretely on the ground GIZ DETA in South Sudan is working in the area of food security and the sustainable improvement of livelihoods. The general vision of GIZ is to become *"the world's leading provider of international cooperation services for sustainable development".* In its mission, GIZ states that it is value-driven and acts *"first and foremost"* in order to *"support the development policy of the German Government"* (GIZ 2012g). The relevant policy in this field is the BMZ strategy paper "Entwicklung ländlicher Räume und ihr Beitrag zur Ernäherungssicherung" (BMZ 2011b).

Where is GIZ DETA going? In the case of GIZ DETA in South Sudan, the strategic goal is to transfer to a Greenbelt programme within the framework of technical cooperation.

What are the key issues that GIZ DETA's strategy must address and how can GIZ DETA best compete?

Table 25 outlines strategic key issues and some selected operations. See the roadmap of Morobo County for further details.

Table 25: Strategic cornerstones, key issues and strategy formulation

Main strategic cornerstones according to BMZ strategy paper (BMZ 2011b)	Key issues that GIZ DETA's strategy must address	Selected activities in order to implement the strategy	Proposed timeframe
Sustainable development of rural economies	Adequately prepare farmers for **market integration**	Search partner for training on basic farm management / define content together	01/ 2013 – 02/ 2013
		Train first facilitators and then FFS on basic farm management	04/ 2013; 08/ 2013
		Collect info on storage building / elaborate training material	01/ 2013
		Train facilitators on storage	01/ 2013; 06/ 2013
		Train FFS on storage and assist selected FFS in building storages	02/ 2013; Start from 01/ 2014
		Introduce further cash crops	Start from 04/ 2014
Sustainable management of natural resources	Train farmers on **sustainable agriculture**	Train FFS on improved fallow and fertiliser shrubs	06/ 2013
		Introduce vegetable production to existing FFS with access to water	01/ 2013 – 03/ 2013
		Introduce IPM	01/ 2013 – 03/ 2013
Provision of social services and technical infrastructure	Strengthen groups in **self-learning** and **invest** in income-generating activities	Training on leadership / financial management / training on communal organisation	02/ 2013; 09/ 2013; Start from 01/ 2014
		Support groups to be registered as cooperatives	Start from 10/ 2013
		Train groups in group saving and investments /train groups on management of IGAs	03/ 2013; 10/ 2013;
		Introduce PTD and AESA	Start from 01/2014
		Support groups in small IGA	Start from 03/ 2013
	Supply farmers with broad spectrum of	Organise field days / exchange visits	01/ 2013; 06/ 2013;

	information sources in order to facilitate decision-making		10/2013
		Initiate radio programs	Start from 01/ 2013
		Elaboration of didactic material	01/ 2013 – 05/ 2013
		Strengthen farmers capacity for self-organised learning and knowledge sharing	Start from 01/2014
Improvement of the political-institutional level	**Support CAD** with capacity and resources to support farmers	Capacity building for CAD e.g. introduce and jointly execute the monitoring and evaluation of FFS	Start from 01/2013
		Participatory evaluation of season and future planning	06/ 2013; 11/ 2013
	Increase the effectiveness of aid and development cooperation in the **fragile context**	Integrate the 10 OECD principles of Good Engagement in Fragile States in further programming	Start from 01/ 2013

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Glossary

Local Terms

Boma: Is an administrative level in South Sudan and can be compared to a municipality.

Feddan: Is the local unit of measurement for area. One feddan is equal to 0.42 ha.

Katala: Is the local unit of measurement for area. One Katala is equal to 200 sqm.

Payam: Is an administrative level in South Sudan and is the category below County.

Agricultural Terms

Agroforestry: A form of intercropping in which annual herbaceous crops are grown interspersed with perennial trees or shrubs.

Broadcasting: Is a method of seeding that is characterised by spreading seed over a relatively large area in contrast to seeding in lines, where seed is placed at a precise spacing and depth.

Bimodal Rainfall: Means that one year has two peaks of rainfall or, in other words has two rainy seasons.

Cation Exchange Capacity (CEC): Is a term from the field of soil science. It describes the maximum quantity of total cations, a soil is capable to hold. This holding capacity depends on the type of clay. CEC is used as an indicator for soil fertility for example.

Conservation Tillage: The use of minimum tillage or no-tillage, in which the seed is placed directly into the soil with little or no preparatory cultivation.

Cover Crop: A close-growing crop grown primarily for the purpose of protecting and improving soil between periods of regular crop production or between trees and vines in orchards and plantations.

Epiphyte: A plant that grows upon another plant or object, which receives its water and nutrients from the air and rain.

Fallow: Land resting from cropping, which may be grazed or left unused, often colonised by natural vegetation.

Green Manuring: A form of improved fallow cropping in which legumes are grown in order to fix nitrogen. Deliberate incorporation of mature legumes into the soil to replenish soil nutrients for the following crop.

Intercropping: Growing of two or more crops simultaneously on the same piece of land.

Integrated Pest Management: The use of all appropriate techniques of controlling pests in an integrated manner that enhances rather than destroys natural controls. If pesticides are part of the programme, they are used sparingly and selectively, so as not to interfere with natural enemies. The same applies if biological controls are part of the programme.

Legume: Plants that are able to fix nitrogen from the air and thereby enrich the soil with plant nutrients and increases soil fertility.

Mulch: Plant or non-living material used to cover the soil surface with the object of protecting the soil from the impact of rainfall, controlling weeds or moisture loss and,

in some cases, fertilising the soil.

Open Pollinated Varieties: Are plants that can reproduce themselves either by cross-pollination or by self-pollination. Their opposite are hybrid varieties.

Perennial Plant: A plant that grows for more than one year, in contrast to an annual plant, which grows for only one year (or season) before dying.

Rotational Cropping: The growing of two or more crops in sequence on the same piece of land. Benefits are similar to those arising from intercropping.

Methods and Approaches

Farmer Field School: Farmer field schools (FFS) are described as a Platform and "School without walls" to improve the decision-making capacity of farming communities and stimulates local innovation for sustainable agriculture. It is a participatory approach to extension, whereby farmers are given the opportunity to make a choice in production methods through a discovery-based approach.

Farming as a Business: The aim is to increase the income and improve food security of rural households by making the transition from subsistence to market-oriented agriculture. Apart from agronomics, in particular topics such as farm management, basics of financial management and marketing are central.

Participatory Technology Development (PTD): This is a process of collective inquiry with the purpose of initiating community action on solving local problems.

PRA Method: The participatory approach incorporates the knowledge and ideas of local people from rural areas in the planning and management process of development projects.

Profit Margin: Profit margins are a measure of profitability. It is the profit divided by the number of sales by taking into account variable, but not fixed costs. When deducting fixed costs you get profit margin II.

Service System: A service system is a technical and organisational network designed to satisfy the needs of the target group or make, for example, a FFS approach work. It comprises of services that are needed and service providers.

Concepts

Disaster Risk Reduction (DRR): aims to reduce the damage caused by natural hazards like earthquakes, floods, droughts and cyclones, through an ethic of prevention. Disaster risk reduction includes disciplines like disaster mitigation, early warning, disaster preparedness, recovery and support to livelihoods.

Fragile Statehood: There is no standard international definition of fragile statehood. Fragile states are those in which state institutions are very weak or at risk of collapse, and whose populations suffer from widespread poverty, violence and arbitrary rule. Women, children and ethnic or religious minorities are especially affected.

Linking Relief Rehabilitation and Development (LRRD): The approach tries to define the transition between short-term humanitarian assistance and long-term development cooperation. The objective is to create different measures that are fitting to the respective intervention needs.

Resilience: Resilience is an antonym for "vulnerability" and relates to improvements in people's livelihood assets. It measures the stability of a social-ecological system when confronted with stresses or shocks.

Annex

Annex 1: Terms of Reference

“Assessment of a Farmer Field School (FFS) approach at GIZ DETA Morobo and recommendations for further strategic planning to enhance the FFS approach for a Greenbelt Programme in South Sudan”.

Background

The GIZ DETA Morobo project started with a trial phase to introduce a FFS approach within the 5 Payams in Morobo County, Central Equatoria state and South Sudan. In order to expand the approach into other areas within the Greenbelt zone, a profound analysis is needed of the FFS methods vis-a-vis the particular livelihoods and to thereby adapt best practices and for strategic planning.

Research fields to improve the FFS approach for adaption into other rural areas (Magwi and Yambio) include amongst others, differentiation of agro-ecological zones for crop production, diversity of agriculture livelihood conditions of rural populations, and knowledge-information sharing among farmers and communities.

Moreover the results of the research are part of GIZ DETA’s objective to further strengthen a need-based agricultural strategy that aims to increase the agricultural production of local farmers based on sustainable agriculture principles, in order to enhance their food security and safeguard their livelihoods.

Objective of the study

Research aims, approach, and methods are as follows:

Evaluation of the trial phase of FFS methods introduced by GIZ DETA in Morobo County, as a basis to generate recommendations for improvement and transfer of best practices to adapt to Magwi and Yambio County.

The outcome of the study may facilitate DETA to further develop its agricultural strategy to increase agricultural production in the region to enhance food security as well as to promote market-oriented production and to improve access to the market.

Tasks of the Team:

1) The study will provide an evaluation of a FFS approach at Morobo County based on the following basis:

Baseline data:

- Compilation of additional relevant agro-ecological / biophysical environment data /(as according to available data) with a focus on agricultural production
- Data collection and summary description of farming systems and common agricultural practices that exist in the region, based on a Farming System Analyses
- Data collection and summary of socio-economic characteristics of farming households and their social environment (based on “sustainable livelihood analysis”) including examples (not comprehensive) of a cost-benefit analysis of smallholders’ livelihood-/farming systems
- Stakeholder / partner and target group analysis
- Evaluation and identification and description of best practices of FFS methods including ToT training modules (e.g. on technical topics such as soil fertility, intercropping, crop diversification, crop intensification, restoring degraded land, biodiversity and ecosystem protection

2) The study will provide a situation analysis for Magwi and Yambio on the following basis:

Baseline data:

- Summary of agro-ecological data /biophysical environment (as far as data available) with focus on relevant data for agricultural production
- Data collection and summary description of farming systems and common agricultural practices that exist in the region
- Data collection and summary of socio-economic characteristics of farm-households and their social environment (based on "sustainable livelihood analysis") including examples (not comprehensive) of a cost-benefit analysis of smallholders' farming systems
- Analyses of potential stakeholders and target groups to be involved in DETA programme

Based on the data and information gained from the evaluation of the FFS approach in Morobo County, the following results and recommendation will be provided:

- Recommendations of best practices and potential for introduction (adaptation) of FFS methods from Morobo County into Magwi and Yambio County and for the strategic planning of the Greenbelt programme

Crosscutting issues of the study's approach will consider the following topics:

HIV/Aids prevention, gender, environmental/natural resources aspects (as far as relevant for dissemination of environmental sound agriculture practices), conflict prevention and sustainability.

Duration and Phases of Study

The study consists of three (3) distinct phases: a two-month preparatory period in Germany, three (3) months of desk study and field work in South Sudan, and a final concluding month back in Germany.

Phase 1: Preparation in Germany (June – July 2012)

During this two month period, team members will work towards acquainting themselves with South Sudan, its history, culture and development context.

Furthermore the team will reflect on the content and approach of the study. The result of the Preparatory Phase is an Inception Report demonstrating a basic understanding of the context and anticipated constraints, which also includes a detailed work plan of field activities and visits throughout South Sudan.

Phase 2: Field Study in South Sudan (August –October 2012)

This phase is the most important phase of the study where team members confront the empirical reality of farming systems and the GIZ FFS approach. Team members will visit the project sites to collect data from the target population and interact with relevant stakeholders. The Team will produce and present preliminary findings of it study at the end of this phase.

Phase 3: Conclusion Phase in Germany (November 2012)

Upon completion of the field study and presentation of preliminary findings in South Sudan, the Team will return to Germany and undertake the final work of analysing, concluding and writing its final Study Report.

Annex 2: Workplan

Table 26: Detailed workplan of field phase in South Sudan

Week	CW	Location	Activities
1	31	Juba / Yei	Arrival Tuesday 31/7/12
			Security briefing / First contacts / Expert interviews
			First Presentation / Discussion of study concept
2	32	Morobo	Preparation of workshop with stakeholders / experts
			Workshop: discussion and adjustment of study concept with GIZ DETA, partners and experts
			Adjustment of methodology
			Training translators / collaborators for field study
			Pre-test of field study methods for FFS
3	33	Morobo	Finalisation of methodology and questionnaires
			Field phase: interviews with FFS, farmers and local stake-holders
4	34	Morobo	Field phase: interviews with FFS and local stakeholders
5	35	Morobo	Field phase: last interviews
			Data analysis
6	36	Morobo	Data analysis + drafting of report
7	37	Morobo	Drafting of report
			Revision of methodology and preparation of field phase in Magwi and Yambio & Nzara County
8	38	Free	Excursion week
9	39	Magwi, Yambio & Nzara	Incorporating feedback in draft report + adjusting methodol-ogy
			Workshop to introduce the study concept to local stakehold-ers
			Training translators / collaborators for field phase
			Field phase: interviews with farmers and local stakeholders
10	40	Magwi, Yambio & Nzara	Field phase: interviews with farmers and local stakeholders
11	41	Yei	Data analysis
12	42	Yei	Drafting of report
13	43	Yei	Final workshop to present results and recommendations to GIZ DETA, partners and target group
			Incorporating feedback from workshop into report
			Departure from Juba, Friday 26/10/12

Annex 3: Resource Persons

Morobo County:

Alexander Solyga, GIZ DETA, Team Leader Eastern and Central Equatorial States

Heinrich Rogg, GIZ DETA, Advisor Eastern and Central Equatorial States

Lagu Charles, GIZ DETA, Head of Agricultural Unit, Morobo County

Nyara Emmanuel, GIZ DETA, Agricultural Supervisor, Morobo County

Wila James, GIZ DETA, Agricultural Supervisor, Morobo County

Duku Emmanuel, GIZ DETA, Agricultural Supervisor, Morobo County

Rebecca Moriku, GIZ DETA, Head of Community Development Unit and Project Co-ordinator, Morobo County

Christine, CAD, Agricultural Commissioner, Morobo County

Mr. Brown, County Government, Department for Cooperatives, Morobo County

Clement Metaloro, AAO, Morobo County

Moses Biladi, AAO, Morobo County

Ambros, Keliko Farmers Association, Director, Morobo County

David, Keliko Farmers Association, Coordinator, Morobo County

Emmanuel Baba, Nyongale Farmers Association, Morobo County

Mawa Malish Jsaak, Morobo County AIDS Commissioner

Muto Moses Richard, Deputy County Education Director Morobo

Yei:

David Bala, Director CTC, Yei

Anthony Tabia Tukabe, Yei Agricultural Research Centre

Ines Wiedemann, GIZ FSAD, Senior Advisor

Sanyangi Wangi, GIZ FSAD, Small and Medium Enterprise Advisor

Magwi County:

Simon Stanley Taban, GIZ DETA, Agricultural Supervisor, Magwi County

Bosco Buni, GIZ DETA, Agricultural Supervisor, Magwi County

Pascal Orijem, GIZ DETA, Agricultural Supervisor, Magwi County

Dede Faida Obombasa, GIZ DETA Peace and Conflict Supervisor, Magwi County

Atim Rose, Agricultural Extension Officer, CAD, Magwi County

Constantine Enoch Oryem, Senior Inspector of Schools of Magwi County

Ersilia Lakulu Onek, Health Officer, Magwi County

Murie Stanley Omudu, SNV, Project Officer, Swedish Development Cooperation, Magwi County

Charles Oguetta, Accountant, Palotaka Seed Center, Magwi County

Yambio & Nzara County:

Grace Wani Kideen, GIZ DETA, Project Coordinator, Yambio County

Bangidi Justin, GIZ DETA, Agricultural Supervisor, Yambio County

Benty Samuel Tumoo, GIZ DETA, Agricultural Supervisor, Yambio County

Nyessi Martin Sigirara, GIZ DETA, Community Mobiliser, Yambio County

Asienzo Sony, GIZ DETA, Community Supervisor, Yambio County

Moses Robert Sambia, GIZ DETA, Community Mobiliser, Yambio County

George Gadi, GIZ DETA, M+E Supervisor, Yambio County

Oleja George, RDAA, Agricultural Supervisor, Yambio County

Bakiri Samue, RDAA Administrator, Yambio County

Wanga Emmanuel, RDAA, Health Supervisor, Yambio County

Anthony Ezekiel Ndeikpo, YAFA, Secretary General, Yambio County

Angelo Edward Zingbondo, NAFA, Chairperson, Nzara County

Paul Zangabai Gabriel, NAFA, Deputy Chairperson, Nzara County

Alison Paida Mborigie, CAD, Payam Extension Worker for Yambio Town Payam, Yambio County

John Dominic Rungongba, CAD County Agriculture Director, Nzara County

Philip Wani Marchelo Draga, FAO - Sudan Productive Capacity Recovery Programme (SPCRP), Extension Specialist, Yambio County

Taata Bate, FAO SPCRP, Administrator, Yambio County

Charles Krimboto, World Vision, Assistant Livelihood Officer

Henry Muganga, USAID, The FARM Project, Agriculture Production Coordinator, Yambio County

Eliaba Y. Habakuk, USAID, The FARM Project, Senior Extension Officer, Yambio County

Michael Gelon Hiriwo, Ministry of Education of Western Equatoria State, General Director

Anton Mongo, Ragozere Agriculture Training Center, MoA of Western Equatoria State, Planning Director

Nairobi, Kenya:

Dr. David Amudavi, Coordinator Farmer Communication Program / Director Biovision Africa Trust, Biovision, Nairobi, Kenya

Germany:

Reinhard Pfeiffer, NADEL, Zürich

Margret Will, Horticultural Economist / Freelance Consultant, Hamburg

Annex 4: Overview and Composition of the FFS in Morobo County

Table 27: Overview and composition of the FFS in Morobo County

Payam	FFS	No. of groups	No. of members	No. of women	Remarks
Gulumbi	Kanza	2	34	10	Dropped out, not counted in total
	Pakujo	2	36	14	Vegetables; fruit trees
	Kendila	2	25	5	Vegetables; slope area
Lujulo	Iraga	3	52	22	Elderly; mainly women; vegetables
	Ikomaza	1	14	6	
	Sobeta	2	35	14	
	Lujulo East	1	21	7	Use market in Kendila; WFP warehouse to be constructed in Kendila
Panyume	Yaribe	3	38	9	Slope area; use market in Yei
	Khor Kindi	1	22	6	WFP warehouse to be constructed in Panyume
	Garawigi	1	23	7	WFP warehouse to be constructed in Panyume
Kimba	Rego	1	24	9	Fruit trees
	Reno	3	68	35	Mainly women; slope area; close to the border of Uganda
Wudabi	Alotto	3	61	17	Youth group; vegetables; slope area
	Bakoubiki	1	33	15	Difficult access; close to the border of the Democratic Republic of Congo; WFP warehouse to be constructed in Nyei
Total	**13**	**26**	**452**	**166**	

Annex 5: Map of FFS Visited in Morobo County

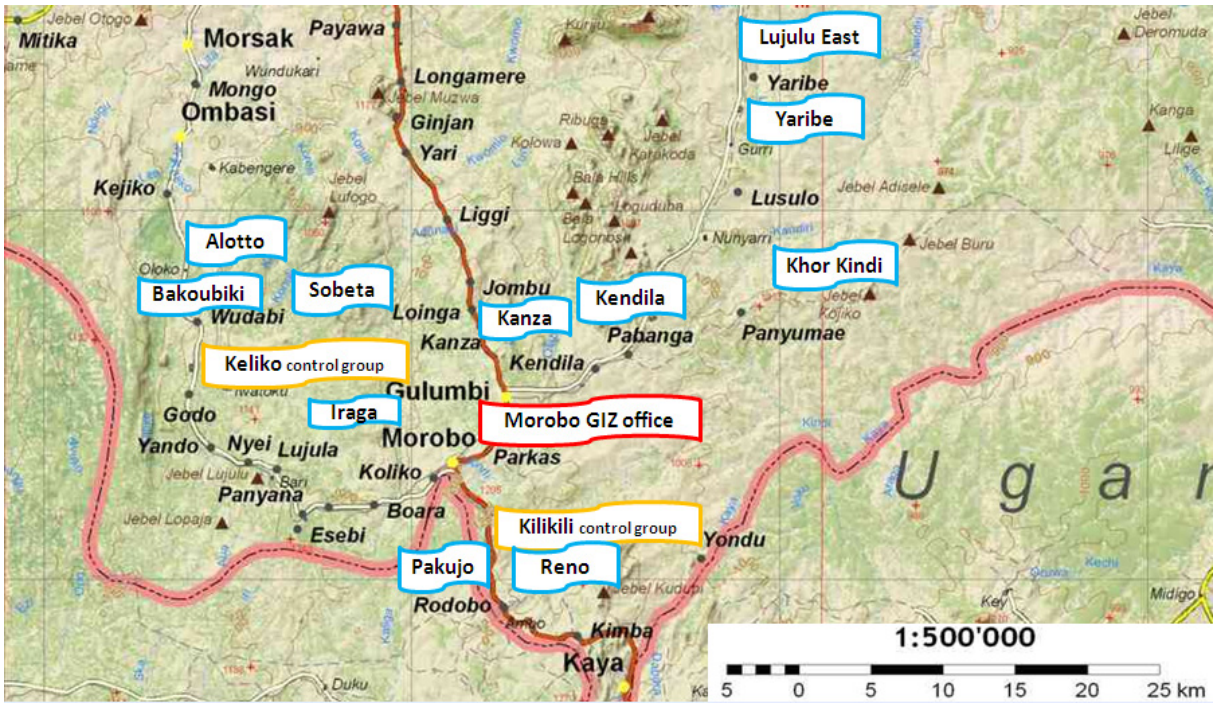

Figure 17: Map FFS groups visited in Morobo County

Annex 6: Map of Farmer Groups Visited in Magwi County

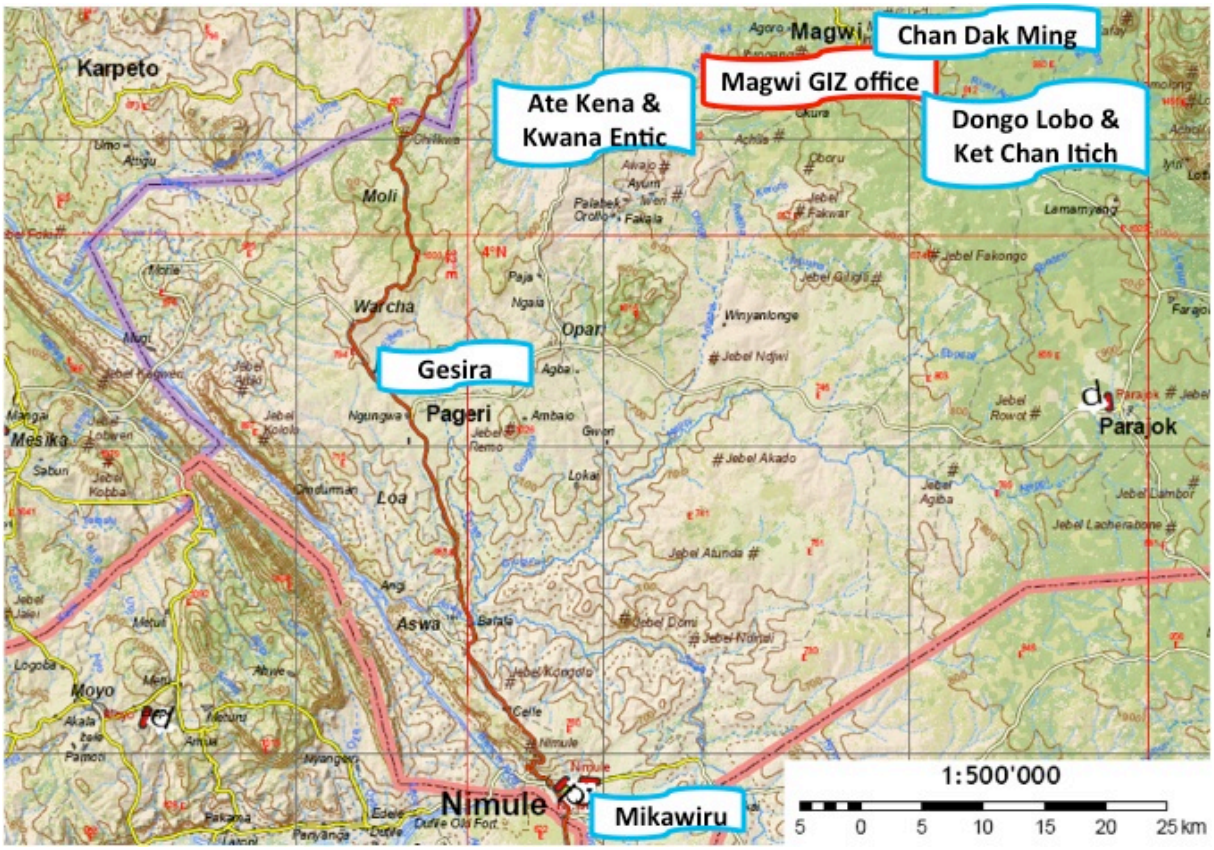

Figure 18: Map of farmer groups visited in Magwi County

Annex 7: Overview and Composition of the Farmer Groups Visited in Magwi County

Table 28: Overview and composition of the farmer groups in Magwi County

County	Payam	Farmer group	No. of members	No. of women	Remarks
Magwi	Panjume	Chan Dak Ming	17	12	Expectations had been raised within the group as GIZ DETA promised to build a group store and to sponsor a truck
Magwi	Pageri	Gesira	30	25	Vegetable group
Magwi	Mugali	Mikawiru	20	18	Clear and well-defined vision of future invest-ments
Magwi	Palotaka	Dongo Lobo	20	20	In the long run both groups would like to become a marketing cooperative
		Ket Chan Itich	20	20	
Magwi	Iwire	Kwana Entic	30	22	
		Ate Kena	30		

Annex 8: Map of Farmer Groups Visited in Yambio & Nzara County

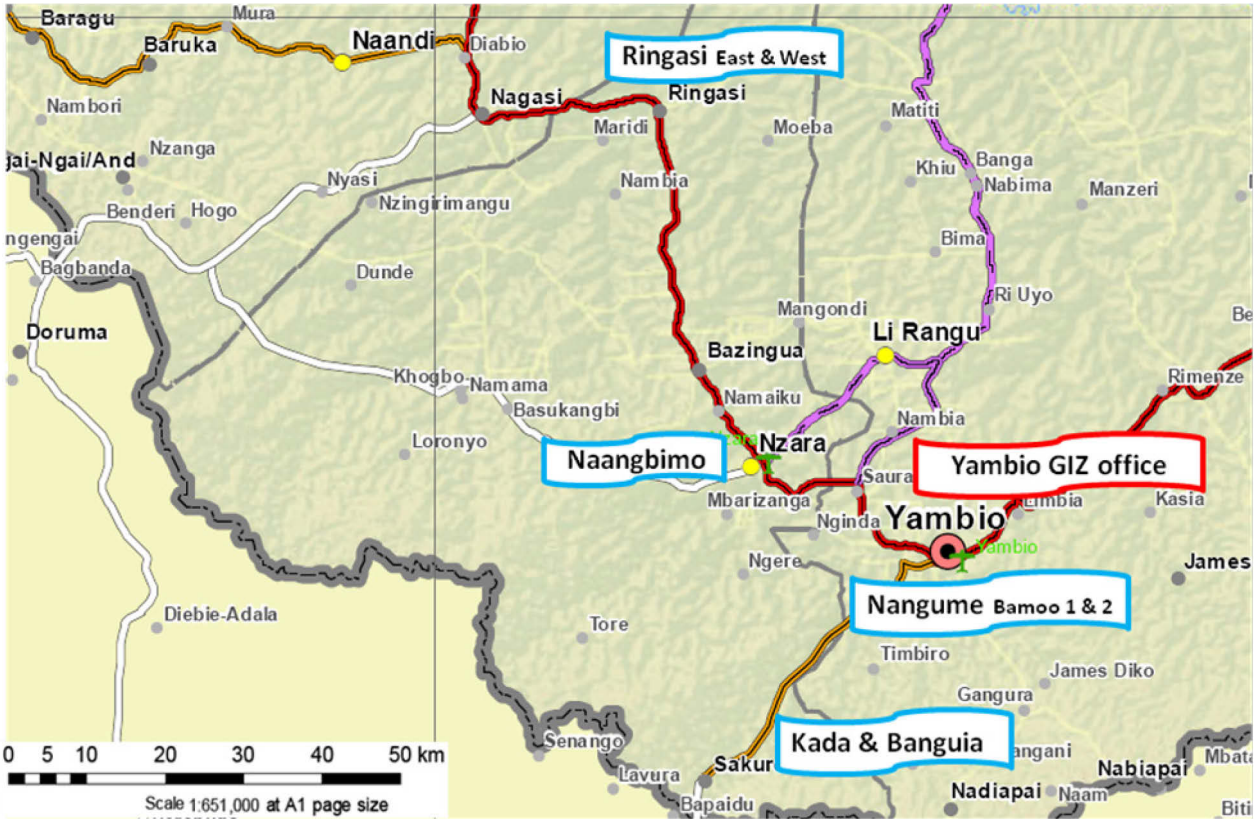

Figure 19: Map of farmer groups visited in Yambio & Nzara County

Annex 9: Overview and Composition of the Farmer Groups Visited in Yambio & Nzara County

Table 29: Overview and composition of the farmer groups in Yambio & Nzara County

County	Payam	Farmer group	No. of members	No. of wom-en	Remarks
Yambio	Nangume	Nangume Bamoo 1	23	9	Opened a bank account and applied for a loan
		Nagume Bamoo 2	?	?	
Yambio	Gangura	Banguia	24	11	Have cleared 25 feddan together
		Kada	26	7	
Nzara	Ringasi	Ringasi East	17	4	
		Ringasi West	23	5	
		Women group	?	?	
Nzara	Naangbimo	Naangbimo	35	17	

Annex 10: Central Research Questions

Table 30: Central research questions

Analysis	Central research question
Identification of agricultural production systems	• What do small scale farmers' production systems look like?
	• What is small scale farmers' knowledge on sustainable agricultural practices?
Identification of livelihood strategies	• Which distinct household characteristics of small-scale farmers have to be considered for planning / implementing FFS?
	• What is small scale farmers' knowledge on market access opportunities?
	• What kind of support infrastructure can small-scale farmers draw on for market-oriented production?
Fragile context	• What are the main obstacles in the vulnerability context for small-scale farmers to do agricultural production?
	• Do the project measures actively integrate the fragile context as a starting point for agricultural production?
Stakeholder analysis	• Which are the relevant stakeholders and how are / should they be involved in FFS?
Assessment and establishment of FFS	• What are the strengths, weaknesses, opportunities and threats of / for the FFS approach to improve agricultural production in the given context?
	• What needs to be improved in terms of management, structure and organisation of the FFS-project? (including PME)
	• What needs to be improved in terms of ground working activities?
	• Which aspects concerning the content and methods need to be improved?
	• What needs to be improved to guarantee the long-term success even in the post-FFS-phase?
	• What are the initial impacts and successes?

Annex 11: Assessment Criteria & First Successes / Impacts

Table 31: Assessment Criteria & First Successes / Impacts

Ground working activities

- All the necessary steps were conducted before implementing a FFS
  - Brief and agree with the local extension officer / CAD
  - Brief and agree with the local government office
  - Request farmers to volunteer to be members of the FFS
  - Discuss with farmers e.g. through farmer meetings and locality
  - Identify the site
  - Hold talks with local leaders and leaders of farmer organisations
- Suitable sites, farmers and facilitators have been properly selected

Long-term success of the FFS-approach

- A viable long-term strategy
- Well defined priority problem / target group
- A well organised, structured, willing and committed farmer group
- Members of the groups have a common interest
- Clear understanding of the concept and procedure of all stakeholders
- Support at different authority levels
- Adequate resources and logistical support
- Proper and guaranteed supervision, monitoring and evaluation of the activities

Appropriateness of content and methods

- To needs and abilities of farmers
- To needs and abilities of facilitators
- To the definition of sustainable agriculture

First successes / impacts

- Knowledge of farmers has increased
- Farmers implement agricultural techniques and practices on their plots
- Economic (e.g. increase of income) or social impacts (e.g. increase of degree of organisation)

Annex 12: Establishment Criteria

Table 32: Establishment Criteria

Logistical support and adequate resources of GIZ DETA • Prerequisites for the establishment of FFS • Adequate project staff • Current project management, organisational structure and resources
Actors' landscape • Identification of stakeholders • Implications for the project
Potential roles for the implementation of a FFS approach • Identification of necessary services • Identification of potential service providers
Ground working activities (GWA) • Suitable methods to conduct GWA • GWA already conducted • Adequate logistics to conduct GWA
Factors for long-term success • Motivation of farmer groups • Organisation and structures of farmer groups • Support from local authorities • GIZ's strategies to create long-term structures

Annex 13: Background Information on Soil Classification (USDA/NSRC 1996)

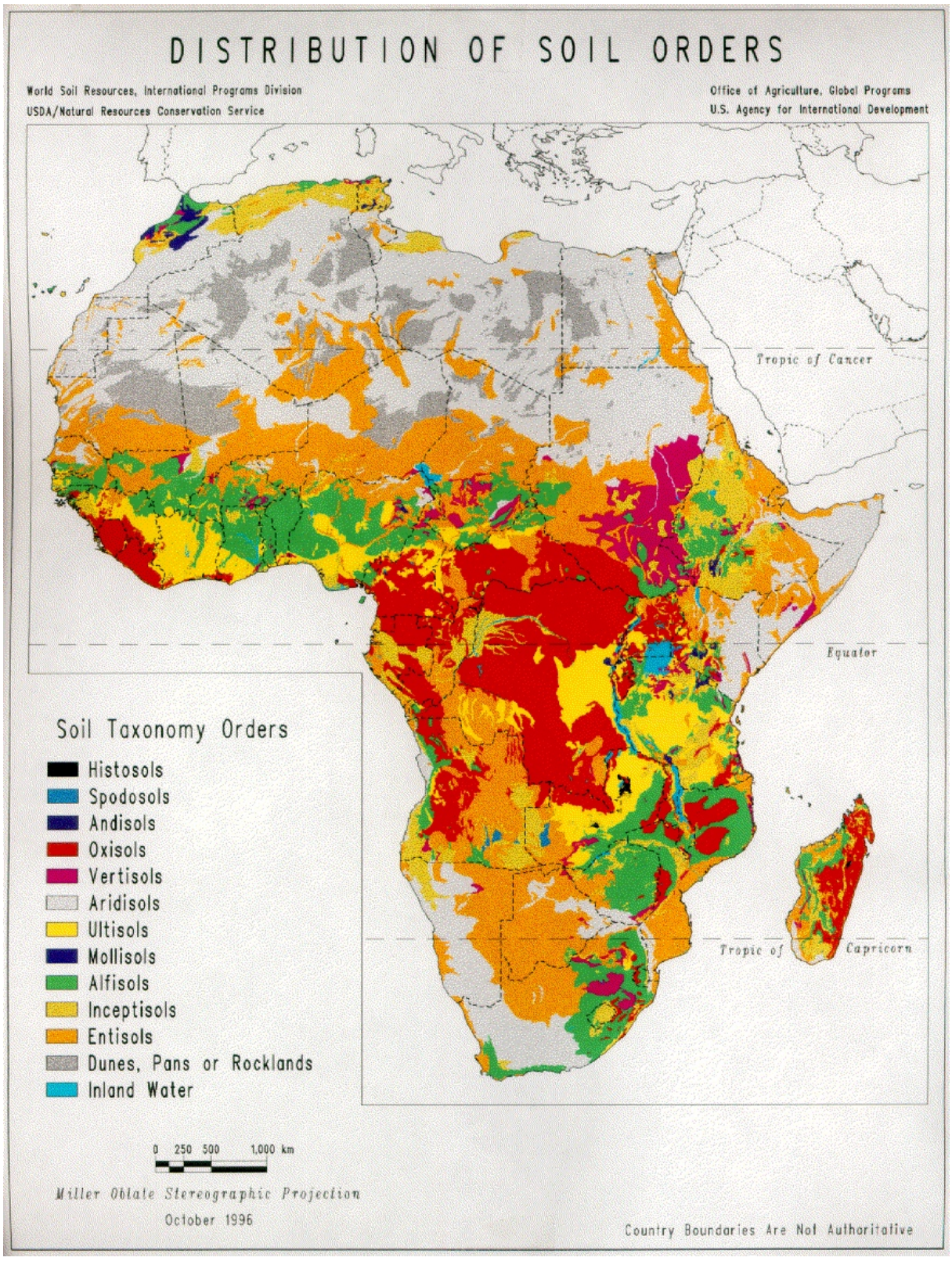

Figure 20: Some background information on soil classification

Soil Types of Africa (ISRIC/FAO/EU 2010 in: Kolawole 2013)

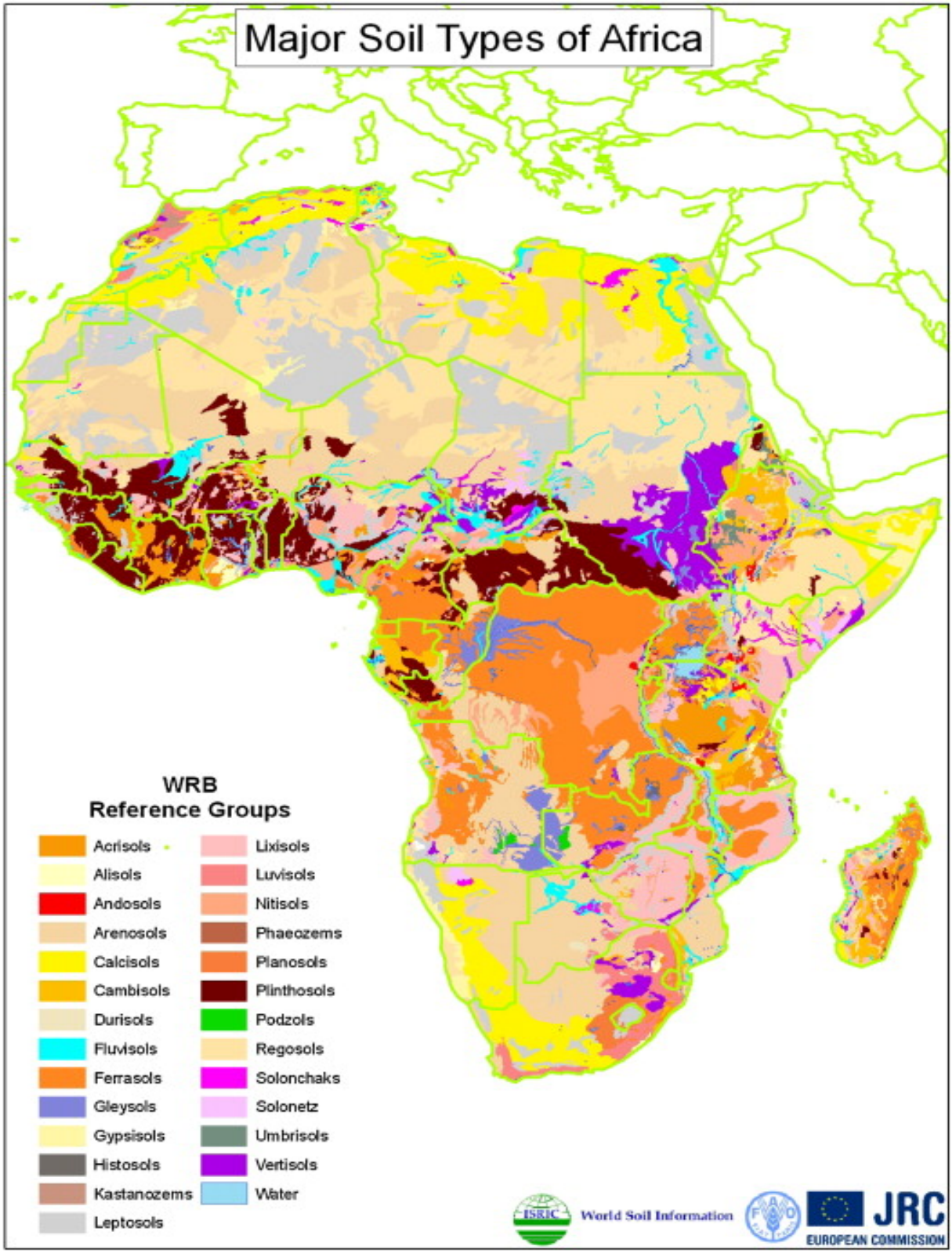

Figure 21: Soil types of Africa

Classification of Soils. USDA and FAO equivalent names for common soils of the tropics (McGregor 2008)

Table 33: Classification of soils

USDA	FAO
Oxisol	Ferralsol
Ultisol	Acrisol, dystric nitisol
Inceptisol	Gleysol, andosol
Entisol	Fluvisol, arenosol
Alfisol	Luvisol, lixisol, eutric nitisol
Vertisol	Vertisol
Aridisol	Solonchak

Humid tropical soils:

Oxisols: Oxisols are the most common soil type of the humid tropics, comprising about half of all soils. Oxisol profiles are deep and mostly well drained. They are characterised by reddish and yellowish colours, with relatively little horizon differentiation. Oxisols have a subsurface oxic horizon that is called “plinthite”. Plinthite development causes strong granulation, which aids aeration and permeability. Granulation is associated with the presence of iron micro-aggregates, principally of haematite, Fe_2O_3 (McGregor 2008). Agricultural advantages compared to related soil classes are that Oxisols are less susceptible to erosion (e.g. than Ultisols) and less susceptible to compaction (e.g. than Vertisols). Agricultural disadvantages are that Oxisols are highly weathered, acid soils, with weak nutrient retention capacity and low levels of available nutrients* (McGregor 2008, also: University of Idaho accessed: 2012).

Ultisols comprise around 30 per cent of humid tropical soils. They are often deep soils, and are invariably acid in reaction. They differ in general from oxisols in that they have greater clay content with depth and higher levels of weatherable minerals. Their physical properties are less advantageous than oxisols. Unlike oxisols, which tend to be found on relatively flat or gently sloping terrain, ultisols are often associated with more strongly sloping ground, and are more susceptible to erosion and compaction. They are often subject to stronger colluvial action than oxisols.

Transition from the seasonally wet savannah zone to the semi-arid zone:

Alfisols are one of the more common types of soils of semi-arid zones, particularly at the junction with the dry savannah zone. Alfisols are well structured, and can be used for agriculture if irrigated. They have a subsurface argillic horizon, and hard pans can develop.

Note:

Oxisols are not to be confused with **Vertisols** ("Black Cotton Soils") which are a distinct class of tropical soils (McGregor 2008). Vertisols comprise only about five per cent of humid tropical soils, and are most often found in seasonally wet savannah regions. These soils are characteristically dark in colour, and are characterised by the presence of swelling clays, especially montmorillonite. As these clays are able to absorb large quantities of water when it rains (and expel this water when the soil dries out), these soils are subject to swelling on wetting, and cracking on drying. This makes them difficult to manage, though they may prove to be of good nutrient status and thus relatively fertile. They are often found in areas that have been sufficiently wet over time to enable weathering to occur to the smectite stage, but not so high that leaching of bases occurs. Dry periods are required for the crystallisation of clay minerals, and the presence of these clay minerals leads to impeded wet-season drainage that hinders leaching and slows down the loss of weathering products. The degree of physical disturbance during wetting and drying often leads to cultivation and trafficking problems, especially during ploughing. Water conditions vary from water logging to restricted water availability owing to water being held within the clay mineral lattices. Cultivation is difficult, as the soil is hard when dry but very 'plastic' and 'sticky' when wet. The soil changes from being hard just before the rains to being plastic once rains set in. One strategy that has had some success in overcoming these problems is to plough just after harvest, when the soil is still moist and not too dry; then to plant the next crop in the loose, dry soil just before the rains. However, this is a high-risk strategy in areas where the onset of the rainy season is not reliable. (McGregor 2008) Vertisols are darker in colour, and more fertile but also more difficult to manage than Oxisols. (See: ISRIC 2012). Vertisols are found in several states in the North and East of South Sudan, for example in Jonglei State, but not in the Greenbelt Zone itself (Compare "**Soil Map of Africa" by USDA/NSRC** above)

* The soils of Morobo, Magwi, and Yambio & Nzara County are virgin Oxisols / Alfisols. Nutrients have accumulated throughout the past 50 years as most of the land was not agriculturally used during the time of war. Standing forest biomass has only been cleared recently[105]. This means that soils in the Greenbelt are still of high nutrient status - a nutrient stock, which needs to be recycled carefully so as not to be lost in the future.

[105] Expert interviews with AAO, Morobo County, and Crop Training Centre, Yei County, 23/10/12 and 20/10/12

Annex 14: Price Variations of Agricultural Products in the Project Region

The prices for agricultural products vary geographically across different regions within South Sudan as well as temporally over the whole year. This is especially relevant for the vulnerability context of small-scale farmers. The following text explains what kinds of volatilities exist in South Sudan and how they develop. Moreover it explains the connection between regional conflict and volatility.

Long-term temporal volatility

Figure 22 shows the price development of 1 kilo of maize from January 2008 to June 2012 in different regions in East Africa. It can be noticed that in Juba the price is the most volatile, and the one that increases most, nearly doubling from about 0.5 to over 1 US$ within 4 years. The actual price for 1 kilo of maize in Juba on the 17th of August 2012 was between 1.13 US$ - 1.58 US$.[106]

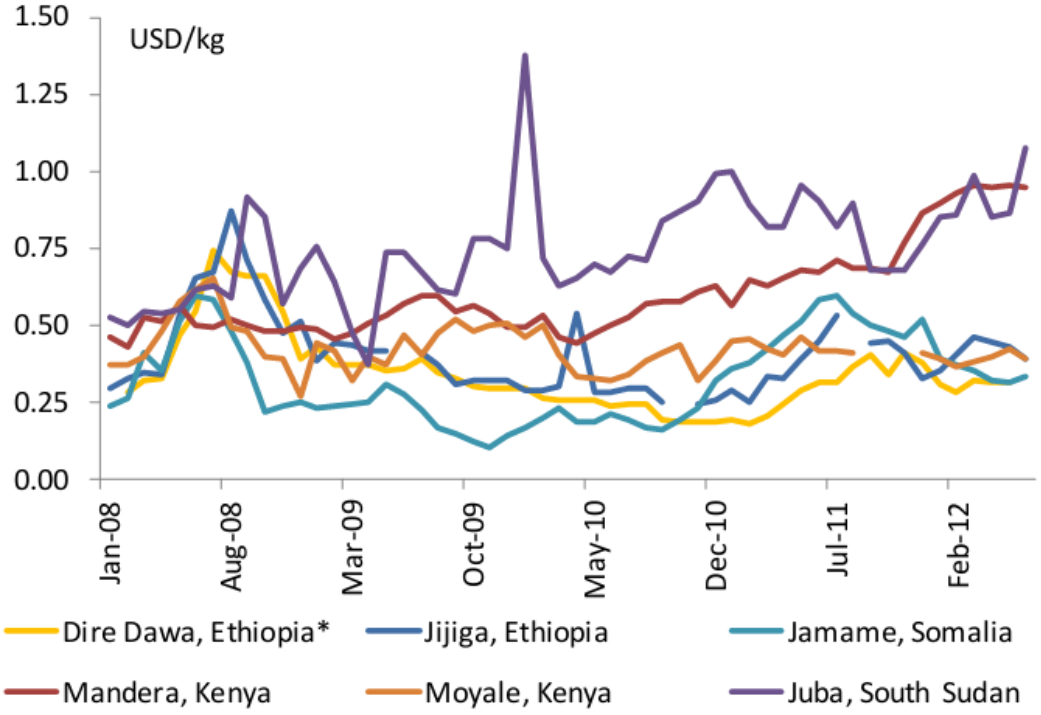

Figure 22: Maize prices in selected areas of East Africa, January 2008 - June 2012.[107]

Short term temporal volatility

During this year there has been a major price increase for most agricultural products. Maize is an example of this development. As Figure 23 shows, the price of maize has been relatively steady over the last years. This year however there has been a quite significant price increase from around 3 SSP in May to 5 SSP in July.

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[106] The New Nation, August 19 – September 1, 2012, No.014, p.26 / the relative high spread is due to different market prices within Juba. Konyokonyo is the biggest and most competitive market with many foreign traders, resulting in the cheapest prices for most commodities. The price also depends on the way the commodity was brought to Juba. The more states to cross during transport within South Sudan, the more taxes to pay.

[107] fews.net 2012: Monthly Price Watch July 2012, p.5

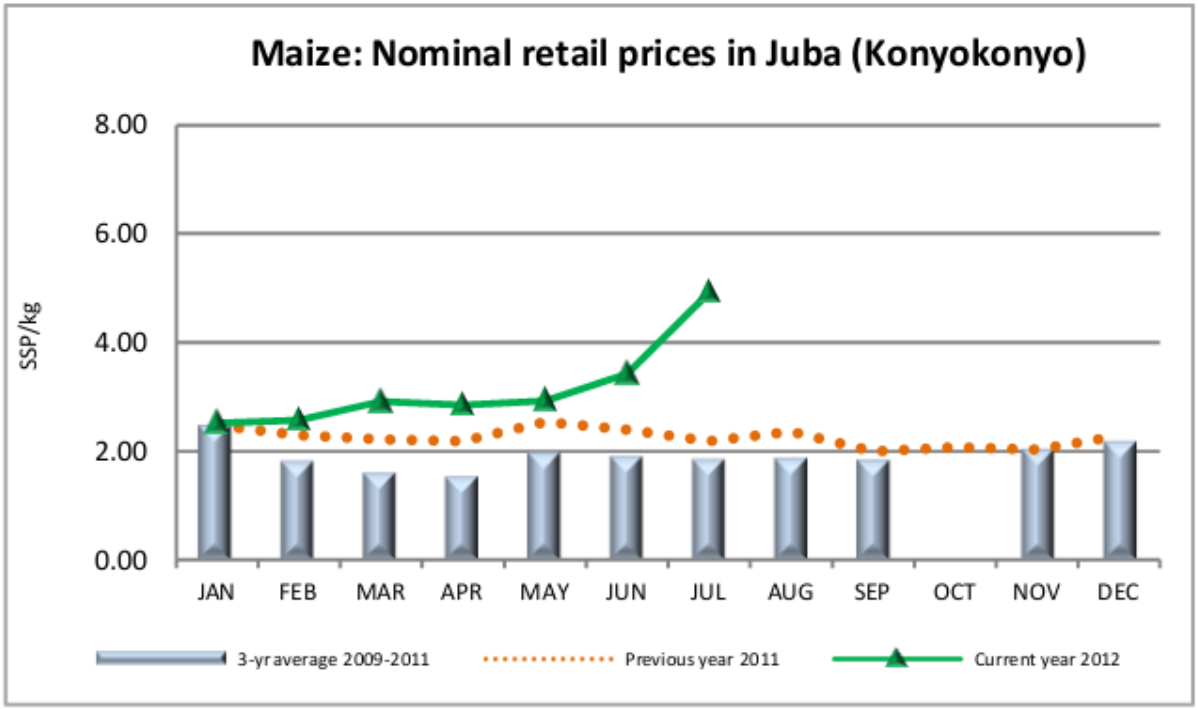

Figure 23: Annual retail prices development in Juba (fews.net 2012: Monthly Price Watch July 2012, p.5)

The connection between price variations and conflict

The reasons for the aforementioned rise are mainly due to the conflict of South Sudan with Sudan. In January this year, South Sudan shut down its oil exports to Sudan over a dispute concerning transition fees. Other issues like unclear citizenships and border conflicts led to a closure of the whole Sudan-South Sudan border in March 2012. This meant that no food could be imported from Sudan into South Sudan. This showed no greater consequence until May 2012 given that over 80% of households in South Sudan areproducing their own food.

But since most of the households produce at subsistence level, little surplus is produced and storage facilities are few. Traditionally the food gap in June and July between the first and second seasons has been bridged by imports from Sudan and Uganda. With imports from Uganda no being the only possible food source, prices increased dramatically due to the high demand. The outlook for the coming months will be better given that the conflict with Sudan is about to be resolved and the first yields are expected in August.

Temporal and geographical volatility of prices

Within South Sudan the prices for some agricultural products are both temporally and geographically volatile. This means on the one hand that there has been a discontinuous price development over the last years and months, which could not be predicted by seasonality. On the other hand, farmers get different prices on different markets within South Sudan. The farmers in Boma Geri for example sold a bassin of beans on the 24th of August 2012 for 120 SSP in Yei but only got 45 SPP per bassin in a closer regional market in Wudabi.

Figure 24 and Figure 25 are documenting both phenomena with the example of the price development of wheat flour in Juba and Malakal respectively. In Juba there was no price decline from February to March like the year before. In Malakal, the price tripled in February this year instead of falling like last year, reaching a peak of over

10 SSP in June. Whereas in Juba, the price remained relatively steady - at under 9 SSP instead of increasing further.

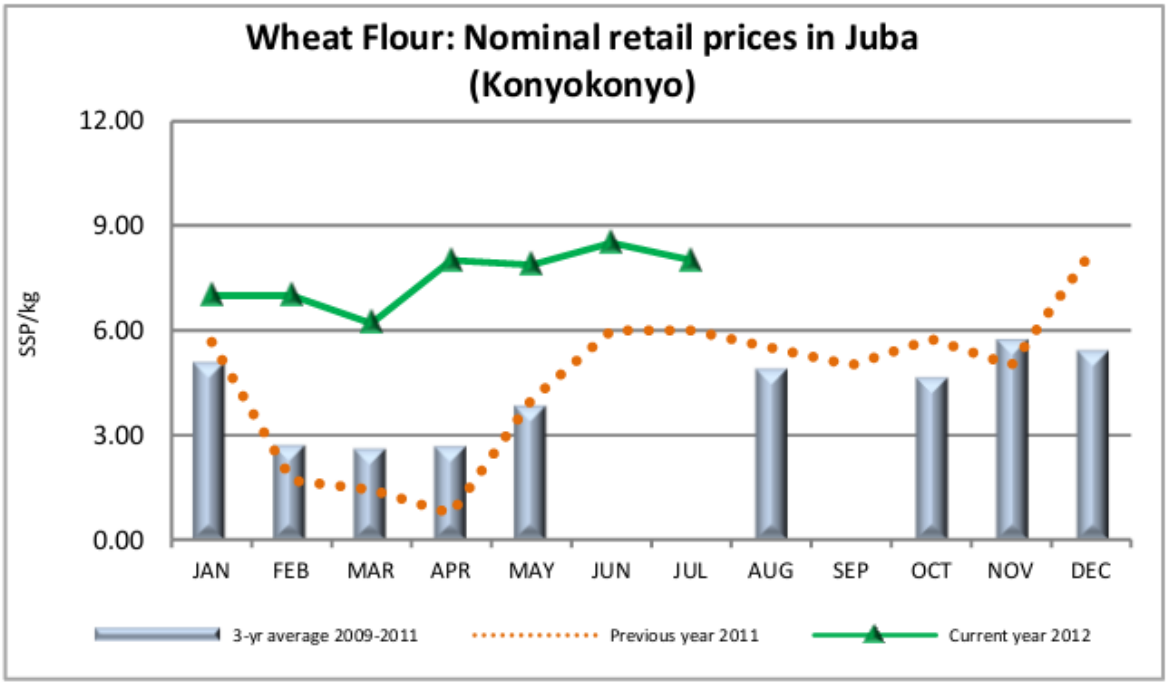

Figure 24: Nominal retail prices for wheat flower prices in Juba (fews.net 2012: Monthly Price Watch July 2012, p.5)

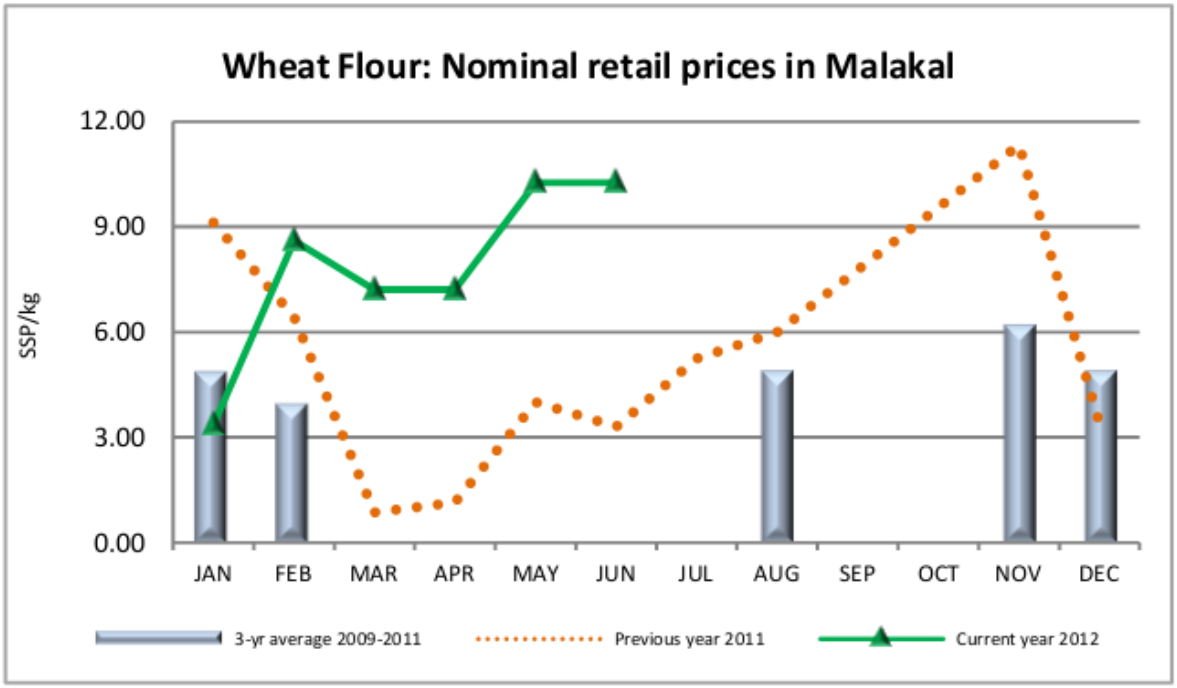

Figure 25: Nominal retail prices for wheat flower prices in Malakal (fews.net 2012: Monthly Price Watch July 2012, p.5)

Annex 15: Concept of Sustainable Agriculture

> *"A Sustainable Agriculture system is one that can indefinitely meet demands for food and fibre at socially acceptable, economic and environmental cost"* (Crosson, 1992 in: Rao et al. 2008).

"Sustainable" implies a time dimension and the capacity of a farming system to endure indefinitely. A sustainable farming system is **resilient to stresses and shocks** and is able to recover from them (Altieri 1995, Conway 1998). Sustainable agriculture ensures a resilient stock of natural resources upon which future agricultural production depends. This happens through **internal counters** such as crop (genetic) diversity or through **external counters** such as improved soil management practices (see figure 26).

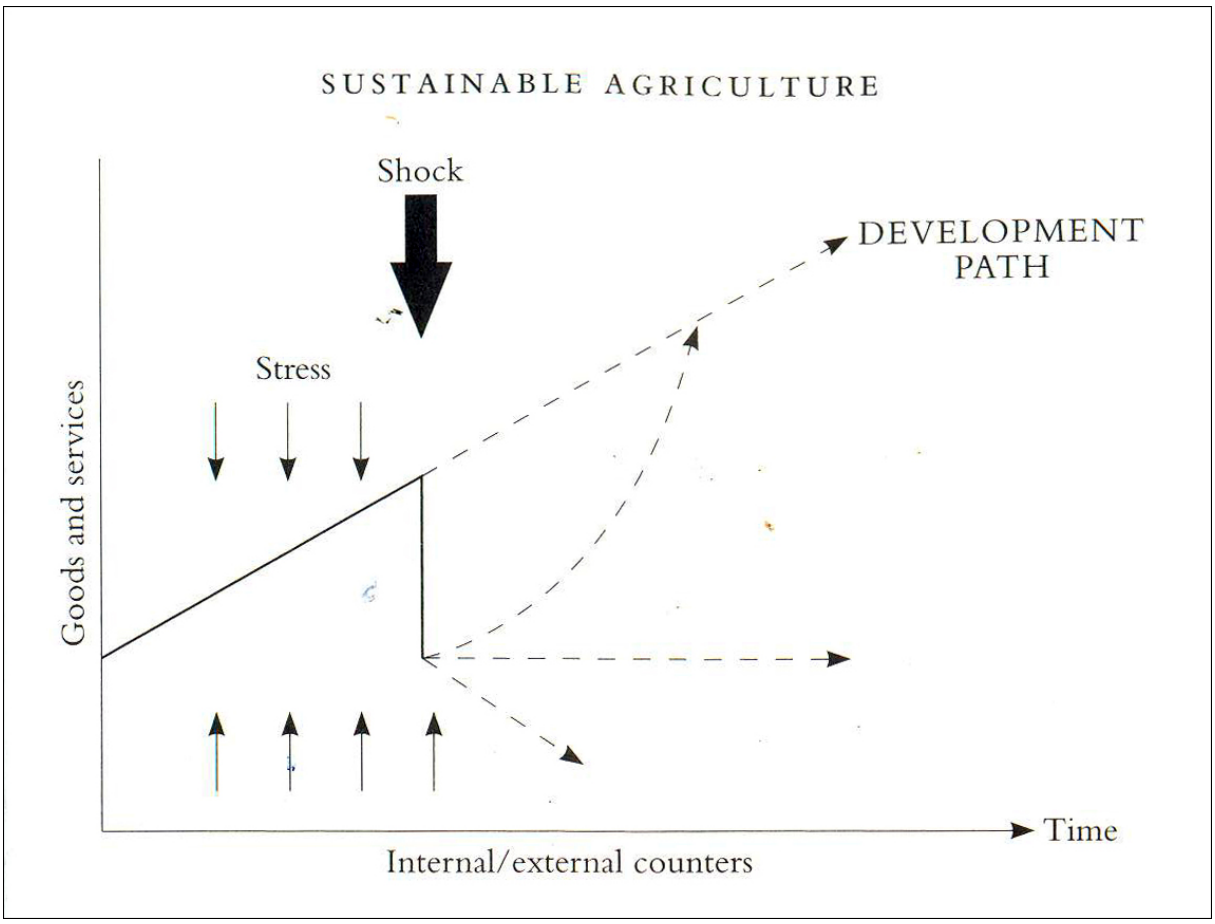

Figure 26: Dynamics of Sustainable Agriculture (Conway, 1998)

As GIZ DETA recognises that rural poverty is the biggest driver behind natural resource degradation (e.g. deforestation for charcoal production) and inefficient agronomic practices that degrade the environment (e.g. shifting cultivation practices), the intention is to improve farm incomes by increasing productivity and market access opportunities for small-scale farmers. A conceptual model of how this is conceived to work is presented in Figure 27.

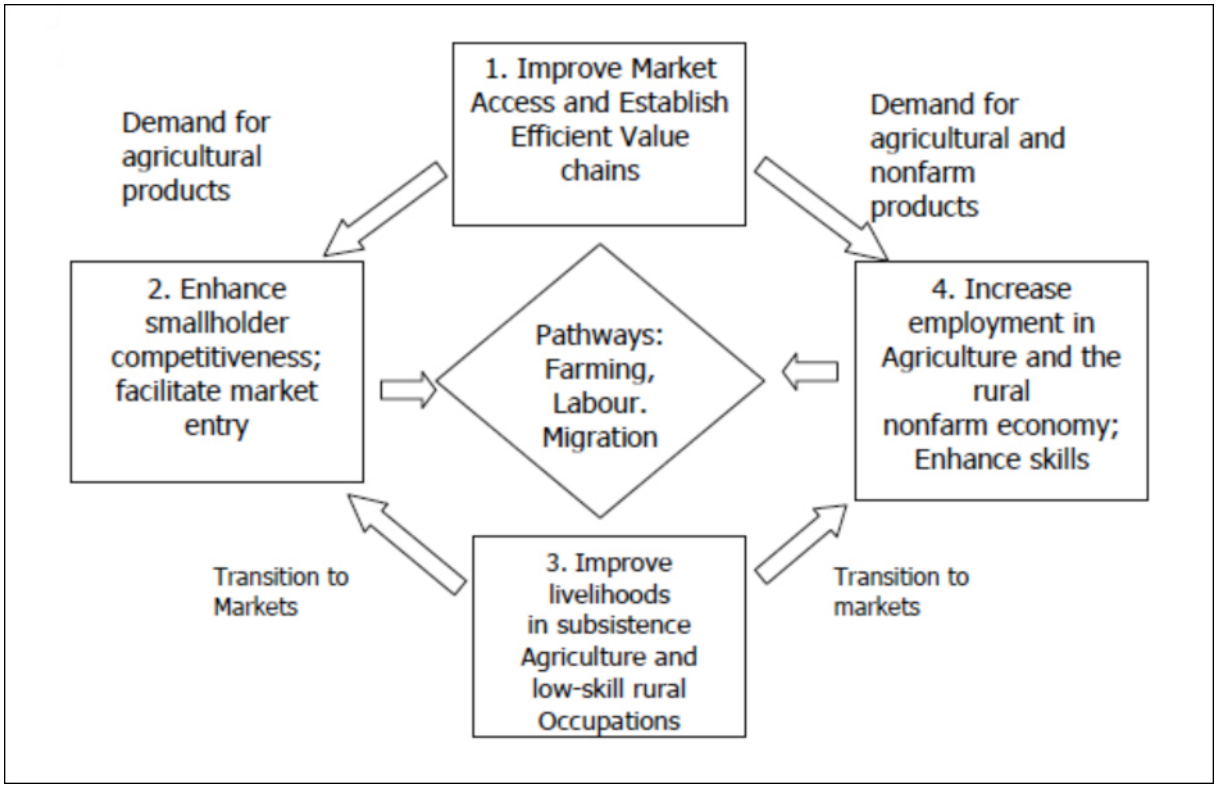

Figure 27: Improving Agricultural Sustainability by Improving the Livelihoods of Agricultural Producers (Kinyua 2008)

An exemplary plan on how to achieve improvements to farmers' livelihoods via FFS interventions is detailed in Table 34:

Table 34: Operationalisation of Improving the Livelihoods of Agricultural Producers (Kinyua 2008)

Objective 1: To increase farmers' productivity			
Strategies	**Action**	**Indicators**	**Responsibility**
1. Restore and maintain soil nutrient levels	• Apply natural manure • Apply fertilisers	• Improvement in crop yields	• Individuals
1. Conduct farmer education on conservation agriculture	• Digging of benches and trenches to arrest erosion • Planting of vegetative cover on bare hillsides • Farmer field schools	• Benches and trenches dug • Area covered with protective vegetation	• Individuals • The Church • Government • Extension Officers
2. Increase the level of irrigation usage	• Educate farmers on water harvesting and maximisation of technologies • Construct irrigation infrastructure	• Improvement in crop yields • No. of farmers adopting water harvesting technologies	• Individuals • The Church • Government
3. Apply improved seeds and inputs	• Education for farmers • Appropriate packaging for inputs	• Varieties adopted • Improved yields	• Individuals • Government

Objective 2: To improve market access			
Strategies	**Action**	**Indicators**	**Responsibility**
1. To link farmers with modern supply chains	• Remove legal and physical barriers to production and marketing • Create information centres • Build market infrastructure for sale, storage and cooling	• No. of regulations repealed • Information centres created	• Individuals • The Church • Government
2. To educate farmers on quality and health requirements	• Produce brochures on SPS • Train farmers on quality control	• Reduction in wastage • Improved sales	• Individual • The Church • Government
Objective 3: To improve the competitiveness of smallholder farmers			
Strategies	**Action**	**Indicators**	**Responsibility**
1. Improve the governance of producer organisations	• Educate farmers on their rights • Enhance the supervision of the producer organisations • Improve the disclosure requirements for farmers' organisations	• Amendments in regulations for farmers organisations • Improved management of farmers' organisations • Expanded disclosure requirements	• Individuals • NGOs • The Church • Government
2. Improve institutional support	• Enact smart subsidies • Protect land rights • Improve access to financial services	• Budget allocation to the sector • Proportion of credit channelled to the sector	• Individuals • The Church • Government • Banks and • Microfinance Inst.

Annex 16: Farmers' Knowledge on Sustainable Agricultural Practices in Morobo County

Intercropping

Intercropping is traditionally practised in Morobo County. Traditional combinations of intercropping include beans planted within maize or cassava. Sometimes the beans are also accompanied by groundnuts and/or cowpeas within a field of maize or cassava. This practise is based on farmers' experience that maize and cassava on their own make for poor soil cover. Problems of wash erosion have been witnessed where beans, groundnuts, or cowpeas are left out. It is less common to find the intercropping of pumpkin, pigeon peas, or "poso" (a local plant that covers the soil very well). Farmers are aware of improving soil fertility by growing legumes like groundnut as an intercrop. Powerful multi-purpose legume plants/crops, such as Desmodium or Sesbania, are not yet known as cover crops.

Rotational cropping

Practising crop rotation is quite common, despite farmers' lack of modern agronomic knowledge and skills on improved soil fertility measures. About 50-80% of local farmers practise crop rotation from one season to the next. It is only a minority of "uninformed" farmers who mono-crop cereals or pulses in sequence, such as planting sorghum followed by maize.[108] Those are the farmers that need to be addressed and offered training on improved farm practices. In general, farmers know about the negative impacts on their soils if they pursue sequential mono cropping. A common pattern of crop rotation practised in Morobo County therefore consists of the following sequence: cereal or pulse (1st rainy season), followed by a legume (2nd rainy season), followed by a vegetable (dry season), followed by two months of rest for the land before the next cultivation cycle (beginning in March-April).

Green manuring

Improved fallows using green manure plants are not practised and have not yet been introduced. If a fallow is incorporated between the growing seasons, farmers leave their fields with fallow without deliberately planting soil-fertility, replenishing, cover crops. When farmers realise that soil fertility is declining on a plot of their land, they incorporate crop residues from the harvested crop. Others follow the practice of planting a long-maturing (traditional) variety of Cassava on depleted land. They hope that the two years that traditional Cassava takes to reach maturity will recover the land.

Use of animal manure

Recycling animal manure is only applied on a minor scale in Morobo County. Although up to 30% of local farmers do recycle some animal manure, this is restricted to small quantities. The dung, which farmers use, is mainly composed of chicken or goat droppings. There is little to no use of cattle manure. In general, the recycling of manure for biomass transfer is almost exclusively limited to vegetable production. Only a few farmers transfer manure to their bananas or to fishponds. The reasons why farmers do not make more use of recycling animal manure are as follows:

[108] Expert interview with AAO, Morobo County, 20/08/12

- Farmers in Morobo County let their livestock graze on communal paddocks, or use abundant public land. Farmers do not provide sheds for zero grazing cattle on their farms.
- Roaming livestock makes collection of larger amounts of animal manure impractical. Freely grazing cattle does not allow the farmer to collect large amounts of dung.
- Farmers repeatedly mentioned a lack of farm labour. The collection of large amounts of animal manure is perceived as a “waste of time”.
- Another aspect in this context is high soil fertility and the use of virgin land. Agricultural land has been cleared recently in Morobo County. Consequently, soil fertility is still high. There is limited awareness among farmers of the potential long-term benefits arising from crop-livestock integration.

Rotational grazing

Rotational grazing systems using high livestock densities are not practised in Morobo County. Although land is abundant and would be suitable for this technique, farmers own little livestock due to financial limitations. Livestock grazes in low densities. Farmers do not deliberately direct their livestock to fields that are to be cultivated the next season.

Use of fertiliser

There is little to no knowledge among local farmers on the use of fertilisers. Farmers have low skills in intensified farming. At present it is estimated that only about 5% of farming households employ inorganic fertilisers, despite the current attempts by the International Fertilizer Development Centre (IFDC) to introduce inorganic fertilisers. Marketing groups such as the "Keliko Farmers Association" are among the first groups to experiment with inorganic fertilisers. The majority of small-scale subsistence farmers, however, do not use any inorganic fertilisers. The Government of South Sudan has had a ban in place for the import of inorganic fertilisers because it argues that the soils of South Sudan are fertile and that inorganic fertilisers, if wrongly applied, could cause soil degradation. It is only recently that a draft Government regulation was passed that foresees the authorised import of DAP (Di-Ammonium Phosphate) and of Urea to apply on poorer, sandy soils. Some farmers associations, however, do illegally import inorganic fertilisers such as NPK (Nitrogen Phosphate Potassium) or CAN (Calcium Ammonium Nitrate) into South Sudan. They source these substances from Kenya or Uganda. The large majority of users apply fertilisers without knowing anything regarding application methods and application rates. So far, standardised soil analysis methods are not available in South Sudan. The very few private service providers offering such services cannot be applied to small-scale farmers. Thus, when used, inorganic fertilisers are most likely applied in the wrong concentrations.

Agroforestry

Agroforestry was first introduced by the Equatoria Region Agriculture Programme (ERAP) to Morobo County in 1978. ERAP introduced Teak trees, delivered required tree seedlings and provided training to local farmers. Today, between 40-70% of farmers in Morobo County deliberately integrate trees on their farms. They also select species other than just Teak.

The most common are wood fuel and timber trees. The introduction of Grevillea, Cypress and Eucalyptus amongst others have become popular recently. Fewer farmers plant fruit trees. Local varieties of fruit are not marketable to the same extent as wood products since they face tough competition from improved (grafted and disease free)

fruits from Uganda. Agroforestry plants like fodder shrubs and fertiliser trees have not yet been introduced in the area. Figure 28 below summarises agroforestry technologies in use on farms in Morobo County.

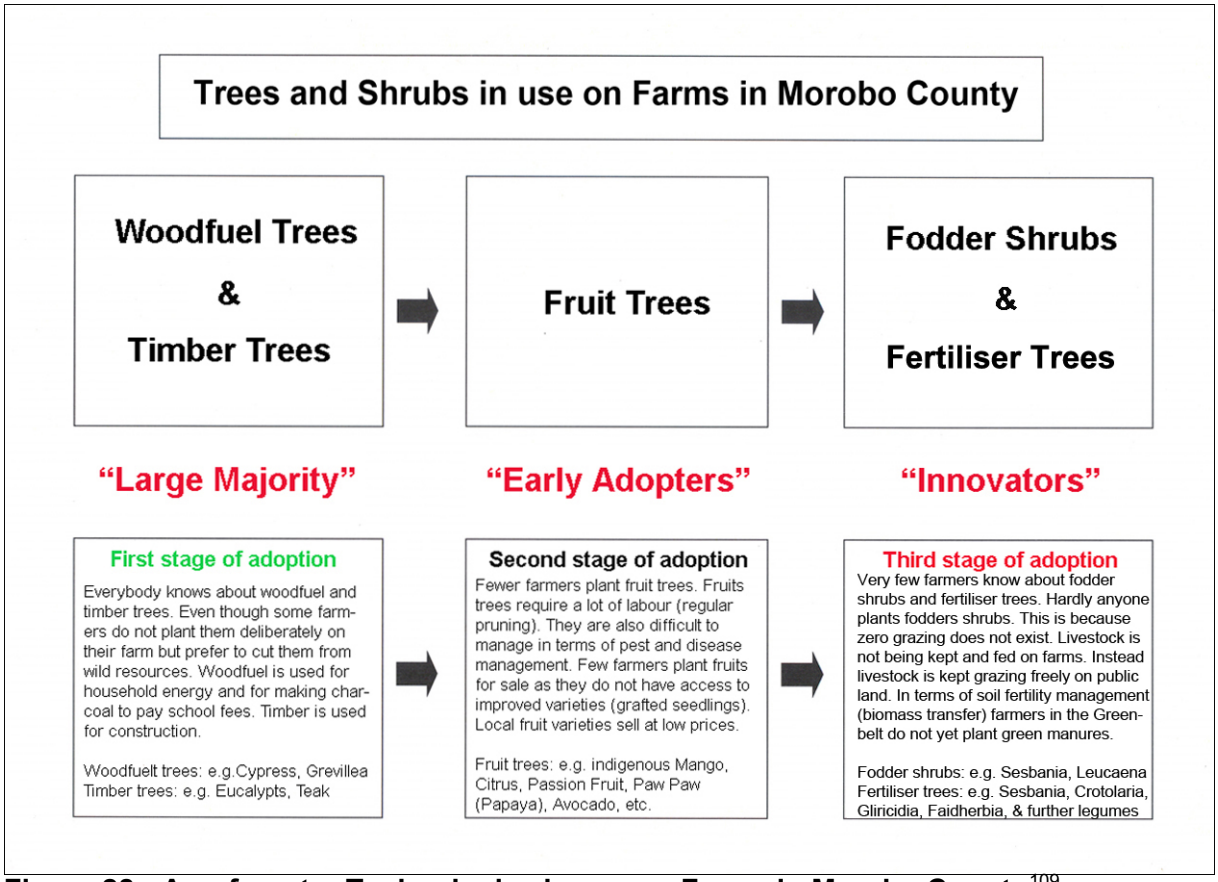

Figure 28 : Agroforestry Technologies in use on Farms in Morobo County[109]

Land clearing as a result of agricultural expansion and timber cutting for charcoal production is an evident problem that degrades natural resources and does not only affect Morobo County. Only about 10 farmer groups in the county experiment with Agroforestry plants and methods. Among them are the farmer groups who meet at the FFS sites of Yaribe, Panjume, Kendila, and Pakujo.

Conservation tillage

Techniques of minimum tillage are not practised and have not yet been introduced in Morobo County. Farmers practice deep-ploughing, either by using a hand hoe or by hiring a tractor. Deep-ploughing can be explained by the deep-rooting types of weeds farmers have to cope with. Two dominant types of weeds are known as "Scorch Grass" (*Digitaria* species) and "Spear Grass" (*Imperata* species). "Witchweed" (*Striga* species) is found as well.[110]

Integrated pest management

[109]Own production; based on expert interviews with AAO, Keliko Farmers Association, and agricultural advisors of GIZ DETA, Morobo County, August 2012

[110] Based on expert interviews with AAO, Morobo County, and field visits to farms of FFS participants, Morobo County, August 2012

Integrated Pest Management is not yet practised in Morobo County. Few farmers appear to make deliberate use of cultural control. To give an example, there is no use of push-pull crops yet, nor are crop rotations strategically planned to avoid pest and disease cycles.[111] Farmers' present knowledge on pest management is restricted to spraying pesticides. Spraying in general is limited to horticultural crops, especially to vegetable production. Farmers do not spray cereals or pulses in Morobo County. Although farmers have poor knowledge on the pesticides they use, experts estimate that about 45% to 60% of local farmers make use of them A few farmers prepare organic pesticides[112], which have proven to work effectively. In use are for example wood ash, chilli peppers, and neem leave batches. But the majority of farmers prefer to buy inorganic sprays since the collection of plant material and preparation of organic pesticide batches tend to be regarded as a "waste of labour time". Particularly where larger areas are to be controlled, such as with field crops, farmers forgo the preparation of organic pesticides. The application of inorganic pesticides is restricted by high financial costs when purchasing these substances.

Appropriate irrigation technologies

Around 30% of farmers in Morobo County are estimated to have access to permanent water points, such as river banks, swamplands, flat surface depressions or valleys.[113] In general, wetlands are used to produce vegetables during the dry season. The prevalent irrigation technology is the use of simple watering cans. In addition to the use of watering cans, some farmers dig out canals to link the water to their vegetable plots. The canals are joined to small reservoirs, from which farmers manually irrigate their crops using the watering can. Interviews with individual farmers revealed that both men and women are engaged in dry season horticulture. Production areas larger than 2 feddan (0.8 ha) are predominantly cultivated by men due to the high labour requirement involved in wetland cultivation.[114] A small fraction of farmer groups have received support from NGOs by using a few traddle pumps for irrigation. Borehole wells are rare to find and construction costs exceed farmers' financial capital. Where wells exist, they are reserved for community-based domestic water - the purpose for which they were constructed by NGOs.

Crop diversification

About 70% of farmers follow diversified cropping in Morobo County. In general, these are subsistence-based farmers with irregular market access. The remaining 30% of farmers have regular market access.[115] These farmers have a higher degree of specialisation. They cultivate larger proportions of single stands of specific cash crops on their farms. Some of the better-organised farmers in Morobo County misinterpreted

[111] Push-Pull Systems, for example by the use of push plants such as Desmodium and pull crops such as Napier Grass to avoid Stem Borer moths and Striga weeds, are not yet known to farmers in Morobo County

[112] Expert interviews with AAO, Keliko Farmers Association, and agricultural advisors of GIZ DETA, Morobo County, August 2012

[113] 6 of 13 FFS demonstration sites of GIZ DETA in Morobo have access to a permanent water point

[114] Focus group discussion with Kenza dropped out group, Morobo County, 27/08/12

[115] Expert interviews with AAO, Keliko Farmers Association, and agricultural advisors of GIZ DETA, Morobo County, August 2012

initial training sessions on “farming as a business” to suggest to them to give up diversified crop production.

Seed saving versus seed multiplication

Farmers in Morobo County only practice seed saving[116] but not seed multiplication[117]. The difference between the two is as follows: Seed multiplication is a deliberate enterprise with the final goal of selling seeds[118] instead of grain. Small-scale farmers do not have the know-how to produce improved varieties, nor do they have the financial security to take the risk of specialising to a degree of producing a single agricultural commodity. Seed multiplication requires farmers to keep safety distances to neighbouring farms to avoid cross-pollination, which can lead to the over-cultivation[119] of varieties. Consequently, seed multiplication schemes, such as the current seed-recollection projects by FAO in South Sudan (GOSS 2011), aim to group farmers in large block farms where single varieties are propagated. But few small-scale farmers take the risk of specialising to such a degree, despite high prices for improved seed on national markets.[120] Consequently, South Sudan needs to import most of its required seeds from abroad (GOSS 2011). There is a severe shortage of improved varieties.

[116] Seed saving is the practice of keeping back harvested grain to replant it as seed in the next season

[117] Seed multiplication is the deliberate effort to produce seeds for commercial purposes

[118] Improved varieties of seed (high-yielding germplasm)

[119] Over-cultivation of a variety, of its foundation seed, results in yield depression in the next generation

[120] Expert interviews with AAO, Morobo County, August 2012

Annex 17: Cultivation Capacities of GIZ DETA's Target Group of Small-Scale Farmers in Morobo, Magwi, and Yambio & Nzara County

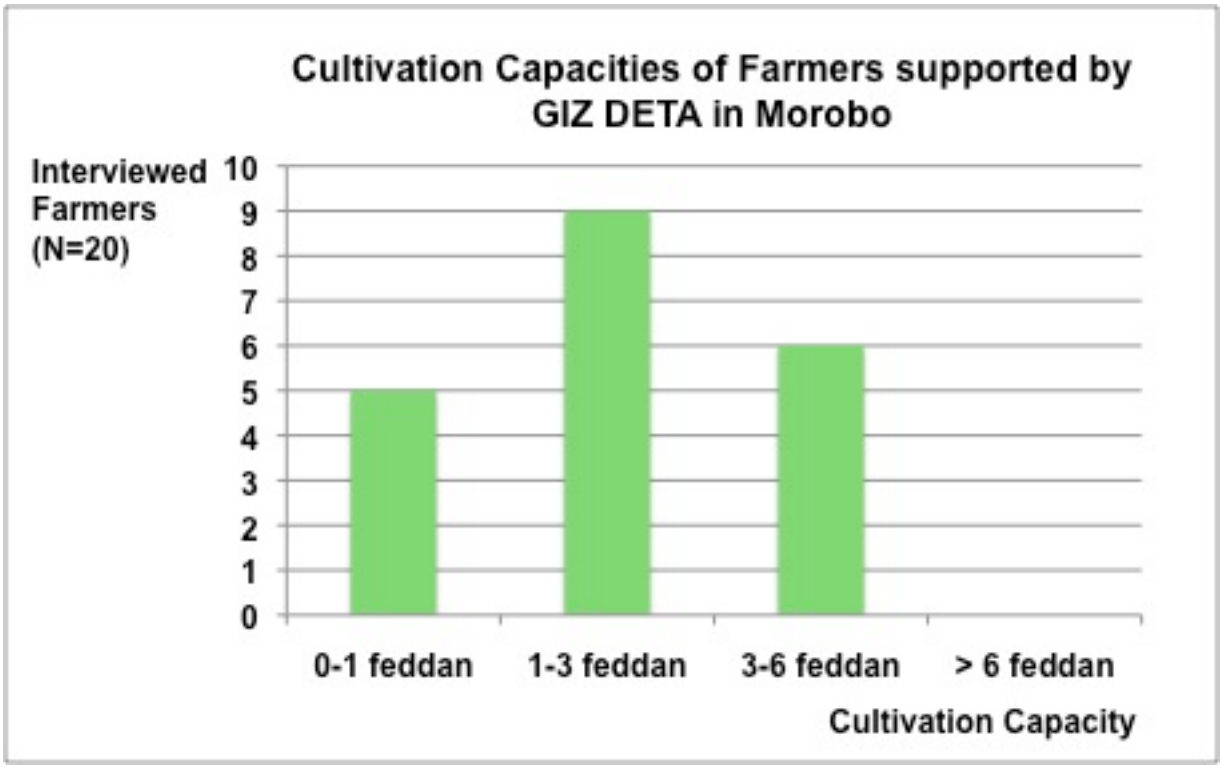

Figure 29: Cultivation Capacities of Farmers supported by GIZ DETA in Morobo County

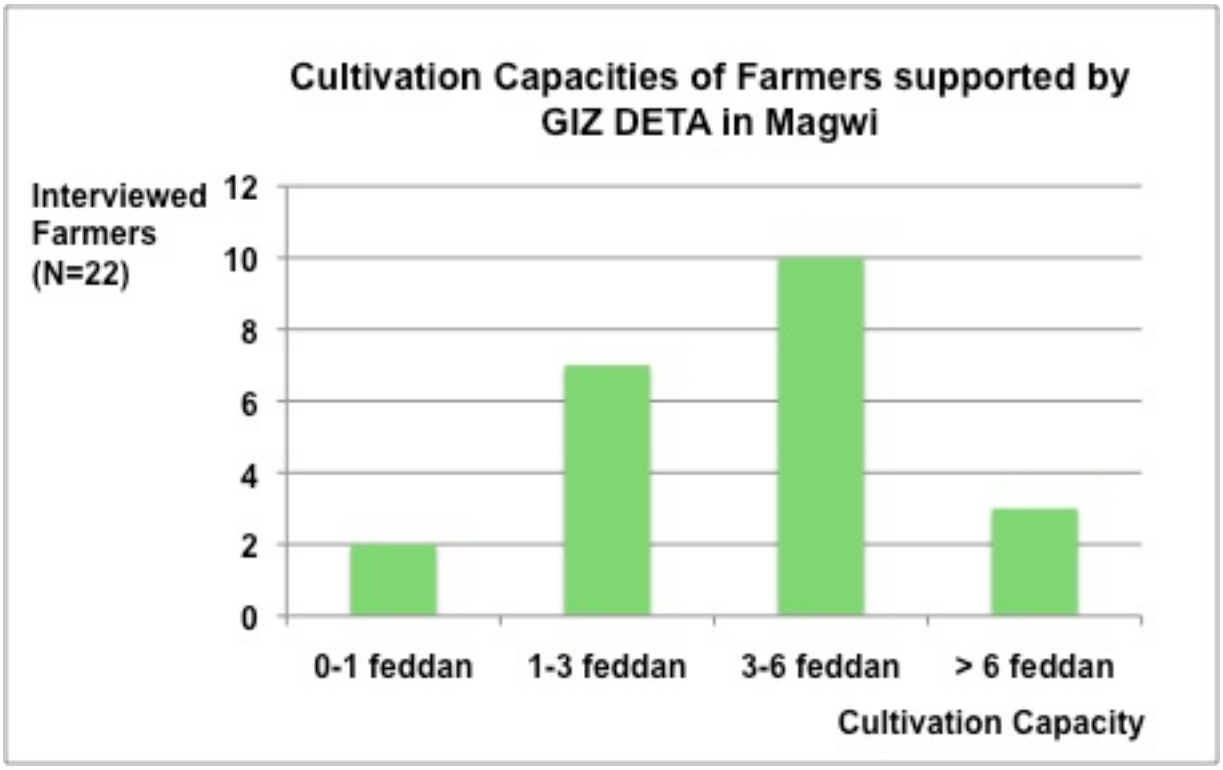

Figure 30: Cultivation Capacities of Farmers supported by GIZ DETA in Magwi County

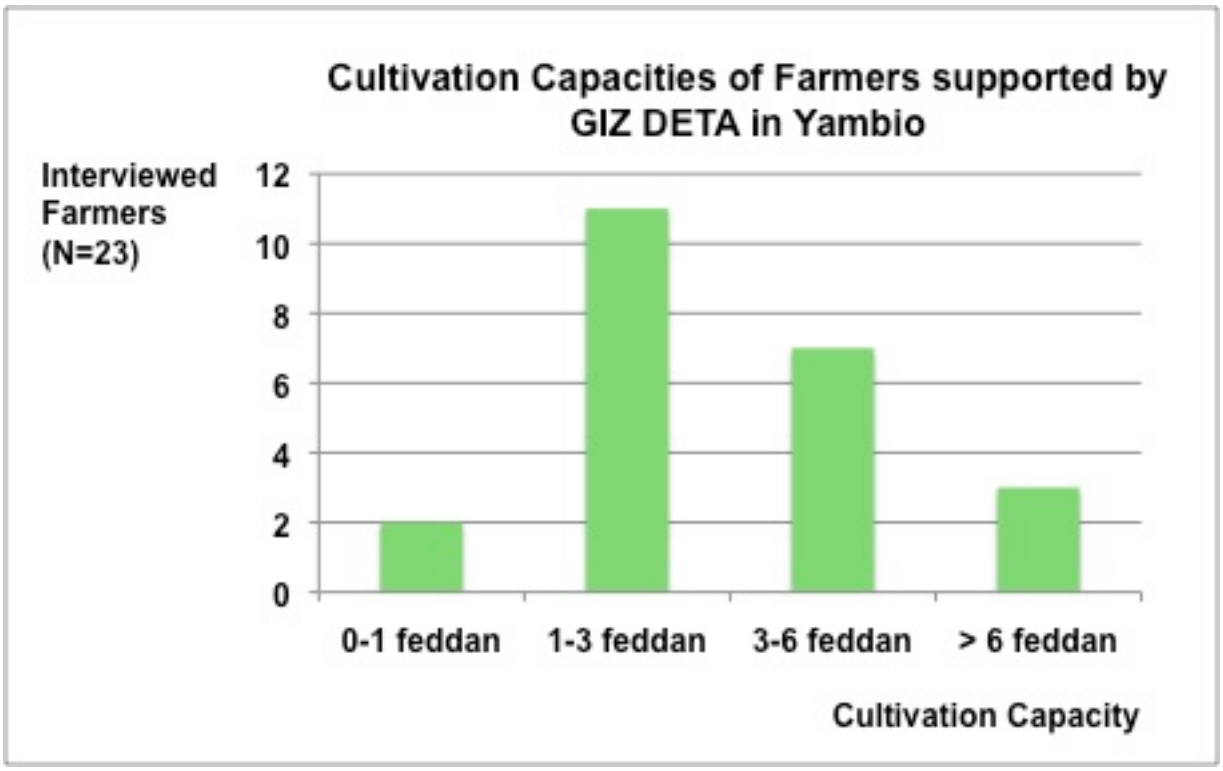

Figure 31: Cultivation Capacities of Farmers supported by GIZ DETA in Yambio & Nzara County

Annex 18: Cost Benefit Analysis of Most Important Food Crops

Table 35: Exemplary Profit Margins - Calculation of Most Important Food Crops – Based on data from AAO

	Beans	Maize	Groundnuts	Cassava	Sorghum	Rice	Onions	Tomatoes	Cabbage
Feddan under cultivation	0.5	1.0	1.0	1.0	1.0	0.5	0.060	0.071	0.095
Yield in kg under cultivation	400.0	1000.0	400.0	2000.0	600.0	500.0	100.0	300.0	400.0
Price per Kg in SSP	6.0	2.0	3.0	2.0	2.0	5.0	6.0	7.0	3.0
Amount sold to the market in kg	350.0	900.0	350.0	1800.0	500.0	400.0	70.0	250.0	300.0
Amount used for consumption in kg	50.0	100.0	50.0	200.0	100.0	100.0	80.0	50.0	100.0
Revenue per area under cultivation (Amount sold x price)	2100.0	1800.0	1050.0	3600.0	1000.0	2000.0	420.0	1750.0	900.0
Total revenue per area cultivated	**2100.0**	**1900.0**	**1050.0**	**3600.0**	**1000.0**	**2000.0**	**420.0**	**1750.0**	**900.0**
Labour costs per feddan	1050.0	950.0	1000.0	1500.0	1100.0	1300.0	2000.0	2200.0	1800.0
Labour costs per area cultivated	525.0	950.0	1000.0	1500.0	1100.0	650.0	119.0	156.9	171.4
Seed costs per feddan	180.0	35.0	120.0	280.0	25.0	90.0			
Seed costs per area cultivated	90.0	35.0	120.0	280.0	25.0	45.0			
Pesticides costs per area cultivated								60.0	40.0
Fertiliser costs per area cultivated									40.0
Costs for renting machinery per feddan	350.0	350.0	350.0	350.0	350.0	350.0			
Costs for renting/using machinery per area cultivated	175.0	350.0	350.0	350.0	350.0	175.0			
Transport costs per km (Whole produce)	33.3	33.3	33.3	33.3	33.3	33.3			
Km to the market	3.0	3.0	3.0	3.0	3.0	3.0			
Total transport costs	100.0	100.0	100.0	100.0	100.0	100.0	120.0	200.0	
Variable costs per area cultivated (Sum: labour, seeds, pesticides, fertiliser and machinery renting costs)	790.0	1335.0	1470.0	2130.0	1475.0	1045.0	119.0	216.9	251.4
Total variable costs (Total transport costs + variable costs per area cultivated)	**890.0**	**1435.0**	**1570.0**	**2230.0**	**1575.0**	**1145.0**	**239.0**	**416.9**	**251.4**
Profit margin (Total revenue - total variable costs)	**1210.0**	**465.0**	**-520.0**	**1370.0**	**-575.0**	**855.0**	**181.0**	**1333.1**	**648.6**
Costs for storage	60.0	100.0	120.0	120.0	60.0	50.0	20.0	60.0	70.0
Costs for tools and farm equipment	40.0	160.0	200.0	150.0	200.0	100.0	–	–	–
Total fix costs (Storage + tool costs)	**100.0**	**260.0**	**320.0**	**270.0**	**260.0**	**150.0**	**20.0**	**60.0**	**70.0**
Profit margin II (Profit margin - total fix costs)	**1110.0**	**205.0**	**-840.0**	**1100.0**	**-835.0**	**705.0**	**161.0**	**1273.1**	**578.6**
Profit margin II per feddan	**2220.0**	**136.7**	**-840.0**	**1100.0**	**-835.0**	**1410.0**	**2705.9**	**17856.1**	**6078.2**

	Beans	Maize	Groundnuts	Cassava	Sorghum	Rice	Onions	Tomatoes	Cabbage
Feddan under cultivation	0.5	1.0	1.0	1.0	1.0	0.5	0.060	0.071	0.095
Yield in kg under cultivation	400.0	1000.0	400.0	2000.0	600.0	500.0	100.0	300.0	400.0
Price per Kg in SSP	6.0	2.0	3.0	2.0	2.0	5.0	6.0	7.0	3.0
Amount sold to the market in kg	350.0	900.0	350.0	1800.0	500.0	400.0	70.0	250.0	300.0
Amount used for consumption in kg	50.0	100.0	50.0	200.0	100.0	100.0	80.0	50.0	100.0
Revenue per area under cultivation (Amount sold x price)	2100.0	1800.0	1050.0	3600.0	1000.0	2000.0	420.0	1750.0	900.0
Total revenue per area cultivated	**2100.0**	**1900.0**	**1050.0**	**3600.0**	**1000.0**	**2000.0**	**420.0**	**1750.0**	**900.0**
Labour costs per feddan	1050.0	950.0	1000.0	1500.0	1100.0	1300.0	2000.0	2200.0	1800.0
Labour costs per area cultivated	525.0	950.0	1000.0	1500.0	1100.0	650.0	119.0	156.9	171.4
Seed costs per feddan	180.0	35.0	120.0	280.0	25.0	90.0			
Seed costs per area cultivated	90.0	35.0	120.0	280.0	25.0	45.0			
Pesticides costs per area cultivated								60.0	40.0
Fertilizer costs per area cultivated									40.0
Costs for renting mashinery per feddan	350.0	350.0	350.0	350.0	350.0	350.0			
Costs for renting/using mashinery per area cultivated	175.0	350.0	350.0	350.0	350.0	175.0			
Transport costs per km (Whole produce)	33.3	33.3	33.3	33.3	33.3	33.3			
Km to the market	3.0	3.0	3.0	3.0	3.0	3.0			
Total transport costs	100.0	100.0	100.0	100.0	100.0	100.0	120.0	200.0	
Variable costs per area cultivated (Sum: labour, seeds, pesticides, fertilizer and mashinery renting costs)	790.0	1335.0	1470.0	2130.0	1475.0	1045.0	119.0	216.9	251.4
Total variable costs (Total transport costs + variable costs per area cultivated)	**890.0**	**1435.0**	**1570.0**	**2230.0**	**1575.0**	**1145.0**	**239.0**	**416.9**	**251.4**
Profit margin (Total revenue - total variable costs)	**1210.0**	**465.0**	**-520.0**	**1370.0**	**-575.0**	**855.0**	**181.0**	**1333.1**	**648.6**
Costs for storage	60.0	100.0	120.0	120.0	60.0	50.0	20.0	60.0	70.0
Costs for tools and farm equipment	40.0	160.0	200.0	150.0	200.0	100.0	_	_	_
Total fix costs (Storage + tool costs)	**100.0**	**260.0**	**320.0**	**270.0**	**260.0**	**150.0**	**20.0**	**60.0**	**70.0**
Profit margin II (Profit margin - total fix costs)	**1110.0**	**205.0**	**-840.0**	**1100.0**	**-835.0**	**705.0**	**161.0**	**1273.1**	**578.6**
Profit margin II per feddan	**2220.0**	**136.7**	**-840.0**	**1100.0**	**-835.0**	**1410.0**	**2705.9**	**17856.1**	**6078.2**

Table 36: Exemplary profit margins calculation of most important food crops – based on Keliko Farmers Association

	Beans	**Maize**	**Groundnuts**	**Cassava**	**Onions**	**Tomatoes**	**Cabbage**
Feddan under cultivation in feddan	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Yield per feddan in kg	864.0	1000.0	420.0	2800.0	1200.0	3000.0	2000.0
Price per Kg in SSP	8.0	2.5	7.0	2.0	7.0	3.0	1.5
Amount sold to the market in kg	750.0	600.0	380.0	2000.0	1100.0	2500.0	1600.0
Amount used for consumption in kg	114.0	400.0	40.0	800.0	100.0	500.0	400.0
Revenue per feddan (Amount sold x price)	6000.0	1500.0	2660.0	4000.0	7700.0	7500.0	2400.0
Total revenue (Revenue x feddan under cultivation)	**6000.0**	**1500.0**	**2660.0**	**4000.0**	**7700.0**	**7500.0**	**2400.0**
Labour costs per feddan	1250.0	1250.0	1250.0	1250.0	1150.0	1150.0	1150.0
Seed costs per feddan	225.0	100.0	300.0	175.0	500.0	160.0	80.0
Pesticides costs per feddan							
Fertiliser costs per feddan	200.0	200.0	200.0	200.0	200.0	200.0	200.0
Costs for renting machinery per feddan	350.0	350.0	350.0	350.0	350.0	350.0	350.0
Transport costs per kg and km							
Km to the market							
Total transport costs	360.0	360.0	360.0	360.0	360.0	360.0	360.0
Variable costs per feddan (Sum: labour, seeds, pesticides, fertiliser and machinery renting costs)	2025.0	1900.0	2100.0	1975.0	2200.0	1860.0	1780.0
Total variable costs (Total transport costs + variable costs per feddan)	2385.0	2260.0	2460.0	2335.0	2560.0	2220.0	2140.0
Profit margin (Total revenue - total variable costs)	**3615.0**	**-760.0**	**200.0**	**1665.0**	**5140.0**	**5280.0**	**260.0**
Costs for storage							
Costs for tools and farm equipment							
Total fix costs (Storage + tools)							
Profit margin II (Profit margin - total fix costs) **per feddan**	**3615.0**	**-760.0**	**200.0**	**1665.0**	**5140.0**	**5280.0**	**260.0**

	Beans	Maize	Groundnuts	Cassava	Onions	Tomatoes	Cabbage
Feddan under cultivation in feddan	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Yield per feddan in kg	864.0	1000.0	420.0	2800.0	1200.0	3000.0	2000.0
Price per Kg in SSP	8.0	2.5	7.0	2.0	7.0	3.0	1.5
Amount sold to the market in kg	750.0	600.0	380.0	2000.0	1100.0	2500.0	1600.0
Amount used for consumption in kg	114.0	400.0	40.0	800.0	100.0	500.0	400.0
Revenue per feddan (Amount sold x price)	6000.0	1500.0	2660.0	4000.0	7700.0	7500.0	2400.0
Total revenue (Revenue x feddan under cultivation)	**6000.0**	**1500.0**	**2660.0**	**4000.0**	**7700.0**	**7500.0**	**2400.0**
Labour costs per feddan	1250.0	1250.0	1250.0	1250.0	1150.0	1150.0	1150.0
Seed costs per feddan	225.0	100.0	300.0	175.0	500.0	160.0	80.0
Pesticides costs per feddan							
Fertilizer costs per feddan	200.0	200.0	200.0	200.0	200.0	200.0	200.0
Costs for renting mashinery per feddan	350.0	350.0	350.0	350.0	350.0	350.0	350.0
Transport costs per kg and km							
Km to the market							
Total transport costs	360.0	360.0	360.0	360.0	360.0	360.0	360.0
Variable costs per feddan (Sum: labour, seeds, pesticides, fertilizer and mashinery renting costs)	2025.0	1900.0	2100.0	1975.0	2200.0	1860.0	1780.0
Total variable costs (Total transport costs + variable costs per feddan)	2385.0	2260.0	2460.0	2335.0	2560.0	2220.0	2140.0
Profit margin (Total revenue - total variable costs)	**3615.0**	**-760.0**	**200.0**	**1665.0**	**5140.0**	**5280.0**	**260.0**
Costs for storage							
Costs for tools and farm equipment							
Total fix costs (Storage + tools)							
Profit margin II (Profit margin - total fix costs) **per feddan**	**3615.0**	**-760.0**	**200.0**	**1665.0**	**5140.0**	**5280.0**	**260.0**

Annex 19: Details of theToT

Table 37: Example of aToT schedule: module 4-6[121]

No	Date	Session 1	Session 2	Session 3
		9:30 to 11:30 am	12:00 am to 1:00 pm.	2:00 to 5:00pm
1	27/6/2012	Recap of previous sessions, Implementation by facilitators and Identification of gaps for intervention	Introduction to plant weeds, Importance and common types of weeds	Weeds control methods in crop production
2	28/6/2012	Introduction to plant pests/diseases, Importance and common types of pests/diseases of field crops (Groups identification task)	Identification of common pests and diseases for field crops. (Groups identification task)	Integrated pests and diseases control methods/ practices
3	29/6/2012	Introduction to seed, and seed production. Seed production agronomy	Seed quality control (Selection of crops for next planting season as seed)	Seed certification and standardisation

[121] Informal training document from AAO

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